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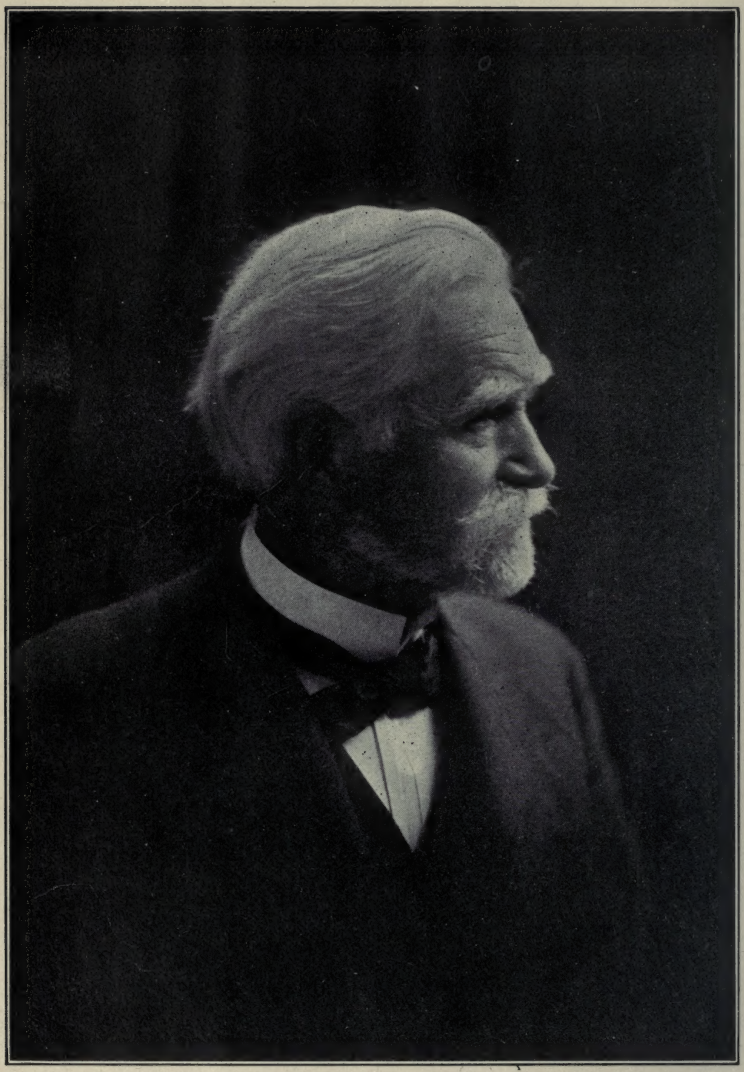

ALBERT BENJAMIN PRESCOTT.

Born at Hastings, N. Y., December 12, 1832; died at Ann Arbor, Mich., February 25, 1905.

President of the American Pharmaceutical Association, 1899–1900.

Second Vice-President of the American Pharmaceutical Association, 1885 86.

PROCEEDINGS

OF THE

AMERICAN

PHARMACEUTICAL ASSOCIATION

AT THE

FIFTY-THIRD ANNUAL MEETING

HELD AT

ATLANTIC CITY, N. J., SEPTEMBER, 1905.

ALSO THE

CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

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BALTIMORE:
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.
1905.

INITIAL MEETING AT NEW YORK 1851.
AMERICAN
PHARMACEUTICAL
ASSOCIATION
INCORPORATED AT
WASHINGTON, D.C.
FEB'Y 21.
1888.
ORGANIZED AT PHILADELPHIA-1852.

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1905

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THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

For some years past the necessity for closer relationship among the various State Boards, to whom the enforcement of pharmacy laws and the registration of pharmacists and their assistants is entrusted, has been evident, and for the purpose of making provision for inter-state reciprocity in pharmaceutic licensure, organization of the National Association of Boards of Pharmacy was effected at Kansas City, Mo., in September, 1904, on the occasion of the fifty-second annual meeting of the American Pharmaceutical Association. A second meeting of the Association was held at Atlantic City, N. J., in September, 1905, and also at the same place and time a joint session with the American Conference of Pharmaceutical Faculties, for the discussion of questions of mutual interest. A copy of the printed Proceedings of the Association may be had upon application to the Secretary-Treasurer, Ernest Berger, P. O. Box 566, Tampa, Fla.

Thus far the Boards of Pharmacy of Ohio, South Dakota, District of Columbia, Maryland, Louisiana, Alabama, Florida, Massachusetts, Indiana, Arizona, Oregon, Michigan, Oklahoma, Georgia, New Mexico, Indian Territory, Illinois, North Dakota, and Vermont have become members of the National Association. The following officers were elected at Atlantic City to serve for the year 1905–1906: I. A. Keith, President, Lake Preston, S. D.; F. C. Godbold, 1st Vice-President, New Orleans, La.; Fred. A. Hubbard, 2d Vice-President, Boston, Mass.; W. R. Ogier, 3d Vice-President, Columbus, Ohio; E. Berger, Secretary-Treasurer, Tampa, Fla. *Executive Committee:* Murray Galt Motter, M. D., Chairman, Washington, D. C.; F. B. Lillie, Guthrie, O. T.; J. D. Muir, Grand Rapids, Mich.; I. A. Keith, *ex-officio;* E. Berger, *ex-officio.*

Constitution and By-Laws of the National Association of Boards of Pharmacy.

CONSTITUTION.

Article I.—The name of this association shall be the National Association of Boards of Pharmacy.

Article II.—The purpose of this association is to provide for inter-state reciprocity in pharmaceutic licensure based upon a uniform minimum standard of pharmaceutic education and uniform legislation.

Article III.—The members of this association shall be officers and members of any State or territorial board of examiners in pharmacy whose board of pharmacy shall have formally approved this constitution, by-laws, rules and regulations, and shall have certified to this association such approval under official seal; there shall also be recognized, as associates, members of such State boards as cannot at present interchange certificates of registration: Provided, that each State represented in this association shall have but one vote, but all members in attendance may participate in the discussions upon any subject considered by this association.

Article IV.—*Section 1.*—The officers of this association shall be a President, three Vice-Presidents, and a Secretary-Treasurer, elected annually, whose duties shall be those usually pertaining to these offices, and who shall hold office until their successors shall be elected and shall have qualified. There shall be an Executive Committee of five, consisting of the President and the Secretary-Treasurer, *ex-officio*, and three members elected by the association. The term of office of the members of the Executive Committee, other than President and Secretary-Treasurer, shall be three years: Provided that, of the first Executive Committee elected, one member shall be elected for three years, one for two years, and one for one year.

Sec. 2.—The Executive Committee shall have charge of all the affairs of this association in securing the objects for which it is organized. Their action shall be subject to the approval of the association at its annual meeting.

Article V.—This association shall meet annually during the sessions of the American Pharmaceutical Association, or at such time and place as the Executive Committee may determine.

Article VI.—The interchange of certificates which may be provided for under this constitution shall go into effect whenever ten States or Territories shall have made application for membership.

Article VII.—Amendments to this constitution shall be presented in writing at an annual meeting, and, for adoption, require a two-thirds vote representing a majority of the constituent boards.

BY-LAWS.

Article I.—Any State or territorial board of examiners in pharmacy desiring membership in this association shall apply to the Secretary in writing, furnishing with its application a certified copy of the record of such board showing that they have approved this constitution, by-laws and rules and regulations, accompanied by a fee of ten dollars, which shall be the annual assessment.

Article II.—Upon receipt of an application for registration upon examination in another State, the secretary of the board shall request the secretary of such examining board to furnish a certified copy of the applicant's examination questions and ratings: Provided, that in all cases the applicant shall have received a rating of 5 per cent. higher than the minimum rate required by the board before which he was examined, and said questions must be satisfactory to the board from which he seeks registration.

Article III.—It shall be the duty of the Executive Committee to prepare blank applications for membership, and other necessary forms, and cause them to be furnished by the Secretary to the several boards of pharmacy.

Article IV.—For the conduct of business at the annual meetings of this association, a representation of one-third of the constituent boards shall constitute a quorum.

Article V.—The secretary of each constituent board shall furnish the chairman of the Executive Committee, at least thirty days before the annual meeting, a report giving the number of applicants registered under this constitution, and any other information required by the Executive or other standing committee.

Article VI.—Amendments to these by-laws shall be presented in writing, and for adoption require a majority vote of the States represented at any annual meeting.

THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

This body, which has for its object the promotion of the interests of pharmaceutical education, was organized at Richmond, Va., May 9, 1900, and, according to Article 9 of its Constitution, is directed to meet annually at the same place as, and coincident with the annual meeting of, the American Pharmaceutical Association.

Thus far six meetings of the Conference have been held, as follows: Richmond, Va., 1900; St. Louis, Mo., 1901; Philadelphia, Pa., 1902; Mackinac Island, Mich., 1903; Kansas City, Mo., 1904; Atlantic City, N. J., 1905. At the last-named meeting a joint session was held of the Conference with the National Association of Boards of Pharmacy and provision made for a continuation of such joint meetings annually for the discussion of questions of mutual interest.

Since organization of the Conference the office of President has been filled by the following well-known educators: A. B. Prescott, of Ann Arbor, Mich., 1900–1901; Jos. P. Remington, of Philadelphia, Pa., 1901–1902; Edward Kremers, of Madison, Wis., 1902–1903; H. H. Rusby, of New York, N. Y., 1903–1904; Geo. B. Kauffman, of Columbus, O., 1904–1905. The officers of the Conference for the year 1905–1906 are: President, H. M. Whelpley, St. Louis, Mo.; Vice-President, C. Lewis Diehl, Louisville, Ky.; Secretary-Treasurer, J. O. Schlotterbeck, Ann Arbor, Mich. *Executive Committee*, W. A. Puckner, Chairman, Chicago, Ill.; C. B. Lowe, Philadelphia, Pa.; E. Kremers, Madison, Wis.; Wm. M. Searby, San Francisco, Cal.; H. H. Rusby, New York, N. Y.

The Proceedings of the Conference, together with its Constitution and By-Laws and a Form of Statement Required of Candidates for Admission to Membership in the Conference, are published annually in pamphlet form, and may be obtained upon application to the Secretary-Treasurer, Prof. J. O. Schlotterbeck, University of Michigan, Ann Arbor, Mich.

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California College of Pharmacy, Dept. of University of Cal., San Francisco, Cal.
Chicago College of Pharmacy, Dept. of University of Ill., Chicago, Ill.
Cleveland School of Pharmacy, Cleveland, O.
University of Iowa College of Pharmacy, Iowa City, Iowa.
University of Kansas School of Pharmacy, Lawrence, Kan.
Louisville College of Pharmacy, Louisville, Ky.
Maryland College of Pharmacy, Dept. of University of Maryland, Baltimore, Md.
Massachusetts College of Pharmacy, Boston, Mass.
University of Michigan School of Pharmacy, Ann Arbor, Mich.
University of Minnesota College of Pharmacy, Minneapolis, Minn.
National College of Pharmacy, Washington, D. C.
New York College of Pharmacy, Dept. of Columbia University, New York, N. Y.
Northwestern University School of Pharmacy, Chicago, Ill.
Ohio State University College of Pharmacy, Columbus, O.
University of Oklahoma Dept. of Pharmacy, Norman, Okla.
Philadelphia College of Pharmacy, Philadelphia, Pa.
Pittsburg College of Pharmacy, Dept. of Western University of Pa., Pittsburg, Pa.
Purdue University School of Pharmacy, Lafayette, Ind.
Scio College Dept. of Pharmacy, Scio, O.
St. Louis College of Pharmacy, St. Louis, Mo.
Vanderbilt University Department of Pharmacy, Nashville, Tenn.
University of Washington School of Pharmacy, Seattle, Wash.
University of Wisconsin School of Pharmacy, Madison, Wis.

MINUTES

OF THE

FIFTY-THIRD ANNUAL MEETING.

The Fifty-Third Annual Meeting of the American Pharmaceutical Association was held at Atlantic City, N. J., during the week of September 4–9, 1905, with headquarters at "The Islesworth," situated on Virginia Avenue and the Boardwalk. The weather was delightful throughout the meeting, and contributed greatly to the pleasure of the occasion. Atlantic City is the nation's playground, and even thus late in the season was full to overflowing with its quarter of a million of visitors—seekers after pleasure, rest and health. The surf was superb, particularly during the first half of the meeting, and many a travel-worn pharmacist from the far interior regaled himself with a dip in the sea. One specially gratifying development of the meeting was the large list of enrolled members shown. Some 225 names were added to the list, and it is now very near the 1800 mark—the highest in the history of the Association.

First Session—Monday Afternoon, September 4, 1905.

The first general session was held in the sun parlor of the hotel, and was called to order at 3 : 30 p. m., with President James H. Beal, of Scio, Ohio, in the Chair.

The President introduced Hon. F. P. Stoy, Mayor of Atlantic City, who was present to welcome the Association on behalf of the municipality and people of the town. Mr. Stoy thereupon came to the rostrum and made an address of welcome marked by cordiality and good-will. The Mayor was not a man to indulge in mere rhetorical phrase; when it came to the point of handing over the keys of the city to the Association, he did this literally, and laid on the President's table a massive and handsome nickel-plated key—a key massive enough, apparently, to open the gates of a much larger city than Atlantic City; a key, in fact, typical of the unstinted freedom of the city so cordially extended by the Mayor.

Mr. H. H. Deakyne next extended a warm welcome to the Association in the name of the Atlantic City Retail Druggists' Association, of which organization he is President.

Mr. William C. Alpers, of New York, a former Jerseyman, and ex-President of the New Jersey State Pharmaceutical Association, welcomed the Association on behalf of the pharmacists of New Jersey. Mr. Alpers is always a good speaker, and paid a glowing tribute to the loyalty of the New Jersey pharmacists to the American Pharmaceutical Association, and the advanced position they had always taken on questions which had agitated the pharmacists of the country in the past twenty years. Mr. Alpers also spoke of the impressions made upon him as the result of a recent visit to the continent of Europe and England. There while they had accomplished much, they are linked to the past, and point to the great deeds of their ancestors, while in America they act in the living present and look forward with confidence to a future of still brighter achievement.

President Beal called on Mr. George F. Payne, of Atlanta, Ga., to respond to the hearty address of welcome of the Mayor, and he did so in his happiest vein. Those who know Mr. Payne's silver tongue will know what this means. Of course, he told a good story to "point out a moral and adorn a tale."

Mr. Leo Eliel, of South Bend, Ind., responded to the address of Mr. Deakyne in well-chosen words.

Mr. Henry P. Hynson, of Baltimore, responded to the address of welcome made by Mr. Alpers on behalf of the New Jersey pharmacists, and he did so in excellent good humor. He said he was glad he had not been called upon to respond to the address of Atlantic City's all too-modest Mayor; that he did not mind responding to a man like the strenuous Mayor of Kansas City, who told things about his city you had never heard of before, and some of which you never expected to hear of again (!). He said that while, in the long ago, it was said that the Wise Men came from the East, in this latter day it was the wise men who came *to* the East, to enjoy the hospitality so heartily extended by the New Jersey pharmacists.

The Secretary then read letters of greeting and good-will from M. C. Peter, president of the National Association of Wholesale Druggists, and Thomas Voegeli, president of the National Association of Retail Druggists, and a similar letter from Frank J. Cheney, president of the Proprietary Association of America, naming W. S. Douglas as a delegate to represent the Proprietary Association at this meeting. He also read five letters from various departments of the Government Service, naming delegates to the meeting of the American Pharmaceutical Association as follows: one from the Acting Secretary of Agriculture, naming Lyman F. Kebler, Chief of the Drug Laboratory, Bureau of Chemistry, to represent that branch of the public service; one from the same Department, naming Dr. Albert C. Crawford, Pharmacologist of the Department, and Dr. R. H. True, Physiologist in charge of Drug, Tea and Poisonous Plant investigations; one

from Surgeon-General R. W. O'Reilly, of the War Department, naming Lieut.-Col. Henry S. Turrill, of New York City, to represent the Medical Department of the Army; one from Surgeon-General Wyman, naming Dr. Reid Hunt, Chief of the Division of Pharmacology of the Hygienic Laboratory, to represent that service; and one from Surgeon-General P. M. Rixey, United States Navy, detailing Pharmacist Geo. H. Klock to represent the Navy at this meeting.

Before calling upon any of these delegates to address the convention, the President said:

Gentlemen, it affords me very great pleasure to announce the presence of an eminent representative of British Pharmacy in the person of Mr. Nicholas H. Martin, of Newcastle-on-the-Tyne, an ex-President of the British Pharmaceutical Conference, and I will ask Mr. Martin to say a few words at this time.

Mr. Martin arose in his place in the audience and said:

Mr. President, Ladies and Brother Members of the American Pharmaceutical Association:

It would be contrary to my previous experience in your great country if I expected to escape from this meeting without the necessity of making a speech, but I did not expect the President would so early request me to do it, and I think he is so entirely out of order here in calling upon an ordinary member of the American Pharmaceutical Association to make a speech at such an early stage in the meeting that I can only think he has done it to offer me an opportunity of apologizing to you and saying how much I have regretted my inability to attend your meetings heretofore. I have been a pharmacist for fifty years, and for some twenty years I have been a member of your Association, but I have been unable to get to your meetings. I regretted very much indeed that I could not be present at your Jubilee Meeting; I tried hard to get there, but it was impossible. But I read your reports from year to year—your valuable volume of Proceedings—and I assure you it has been not only a pleasure, but a profit, to be a member of this Association.

Now, I belong to the Old Country, where Mr. Alpers says we live too much in the past and think too much about our ancestors. I hope that may be a redeeming feature in my case, that I have been so long in coming to the meetings of your Association. (Applause.)

My train was six hours late, and I gave it up as almost hopeless that I should get here in time to hear your President's Address, but fortunately I was able to reach Atlantic City in time for that. I will not stand in the way of his delivering his Address at this time. Gentlemen, I thank you very much, and assure you that the pleasure of being with you is enhanced by the fact of my long delay in getting to your meetings. (Applause.)

THE PRESIDENT: Are any representatives or delegates present whose credentials have not been announced from the desk? If there are, we will be glad to hear from them. The Chair has not been informed as to the presence of these gentlemen.

There was no response to this invitation.

The Chair then called on Mr. John Hargreaves, of Toronto, to address the Association as the representative of the Ontario College of Pharmacy. Mr. Hargreaves said that, like most of the gentlemen present, he was a working, retail pharmacist, not a platform speaker. He said he had come

to learn something, and he thought he had come to the right place. He spoke for the pharmacists of Ontario, and conveyed their fraternal greetings.

The Chair next called on Mr. Thomas F. Main, as the duly accredited delegate of the National Wholesale Druggists' Association, to say a few words on behalf of that body, and Mr. Main delivered himself with his accustomed directness and vigor. He said the American Pharmaceutical Association had been aptly termed the "clearing-house of the drug trade," as in it met on common ground not only the retailers and wholesalers of the country, but that great body of men who devoted their lives to pharmaceutical education. He conveyed the hearty greetings of his organization, and its best wishes that this meeting might be the most successful in the history of this the oldest drug association in the United States. He also expressed the hope that both associations in the future, as in the past, might act together in all matters of material interest and for the advancement of pure pharmacy.

Dr. Reid Hunt being next called on as the representative of the Public Health and Marine Hospital Service expressed the hearty sympathy of the Service with the fundamental purpose of this Association to maintain a higher plane in pharmacy, and said the Department was glad to do what little it could to contribute to that end.

Mr. A. M. Roehrig was also invited by the chair to address the Association as a representative of the Public Health and Marine Hospital Service. Mr. Roehrig expressed surprise that he should have been named as a delegate, as he did not know of his appointment until he heard it from the lips of the President. He called attention to the good work the Department was doing in the suppression of the yellow-fever epidemic in New Orleans and the South, and adverted to the valuable work inaugurated by Surgeon-General Wyman, upon the request of the American Pharmaceutical Association at the Mackinac Island meeting two years ago, in establishing a diphtheria antitoxin standard for the country. He was glad to state that this standard had been definitely fixed now, and was recognized by the Pharmacopœia of 1900, just published, "the most scientific Pharmacopœia that has ever been published in the world," he declared.

By invitation of the Chair, Mr. W. S. Douglas, delegate from the Proprietary Association of America, then spoke a few words of cordial greeting on behalf of that organization. The Proprietary Association owes all it is to pharmaceutical and medical research, he said, and they could not get along without their brethren of the mortar and pestle. He thought the whole class of proprietors ought not to be held to too strict accountability for the few black sheep that get into the fold.

Mr. George H. Klock, Pharmacist in the United States Navy, was the next speaker, and he touched on the efforts of the pharmacists in that branch of the public service to obtain that recognition that they felt was their just due, and of the progress they were making to that end.

President Beal then called on Mr. J. P. Remington, "a citizen of Pennsylvania and New Jersey, and a citizen of the world," to "pass over the ground and touch up anything that might have been missed by the preceding speakers." Mr. Remington, in his characteristic way, proceeded to do this, after first explaining that his failure to be present during the early part of the session was due to the automobile races down the beach, where an attempt was made to break some world's speed-records. He extended to the members of the Association a warm welcome to Atlantic City, and denied the existence of such a thing as a New Jersey mosquito—at least, he would not know one if he were to see it (!). With Mr. Martin, of England, to take care of the past, and Mr. Alpers, of New York, to take care of the present, with the treaty between Russia and Japan an accomplished fact, and the new Pharmacopœia out, the future was assured.

First Vice-President P. C. Candidus, of Mobile, was called to the chair, while President Beal read his address:

THE PRESIDENT'S ADDRESS.

THE MISSION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Judged by the lines upon which they laid its foundations, and by the materials which they contributed to its superstructure, the first and chief intent of the fathers of this Association was to make it an institution for the educational betterment of American pharmacy, and to this traditional mission the organization has closely adhered during its more than half a century of active existence.

Nor is the sphere within which this mission is to be exercised bounded by narrow limits. In whatever field accurate knowledge is of use to the practitioner of the art and mystery of pharmacy, there it is the function of this Association to act as the collector and conservator of that knowledge.

To elaborate correct theories of education and legislation; to inquire into and, if possible, to formulate the principles of the peculiar economics which condition the pursuit of pharmacy as a practical profession; to consider the code which should govern the relations of the several branches of that profession to each other, and to encourage the observance of such relations as will best promote the prosperity of the whole; to gather and classify the facts which make the art of the pharmacist of service to his age and community, and the source of an honorable and profitable livelihood to himself—these are the most appropriate and important functions of this Association, and lead it into the fields where it can most profitably expend its energies and reap the largest harvest of valuable results.

In short, the mission of the American Pharmaceutical Association is to be, in the widest and fullest sense, the great post-graduate school of American pharmacy.

It is the particular business of the ordinary college of pharmacy to give the student the information which concerns the narrow round of his daily duties; it is ours to teach him the broader and not less important knowledge that comes from a survey of the whole field of pharmacy. It is the province of the college to acquaint him with the positive requirements of the statutes under which he is permitted to practice his profession; it is ours to instruct him in the philosophy of these statutes, to advise him regarding the kind of legislation which is sane and wise and helpful, and to warn him against the sophistries of that which, though it promises a panacea for all pharmaceutical ills, can end only in disappointment and disaster.

The chief end of the college training is the good of the particular individual, and to

make him a safe and capable pharmacist; the prime object of our curriculum is to make him an active and valuable member of the pharmaceutical community, to the benefit of the whole profession, and the good of society to which he renders his professional services.

To give instruction in this ample curriculum, the Association has summoned to its faculty well-nigh every master in American pharmacy—a roll of specialists whose learning, as shown by their works, is not the fruit of academic discussion, but the safe and sure knowledge wrought out in the laboratory of practical experience—a faculty upon whose emeritus list are recorded such names as Parrish, Procter, Maisch, Rice, Squibb, Hoffman, Prescott, and a host of others who served their day and generation as usefully and as unselfishly as any who have ever wrought in the field of human endeavor.

To more particularly describe the manner in which this Association has discharged the functions which it has assumed would exhaust both time and space, but it would be difficult to discover within the limits of American pharmacy an effective force for good, or an idea that has made for the progress of our vocation, either as an art or a science, that did not originate within this Association or within the sphere of its influence, or that has not, at the very least, been fertilized and made fruitful by contact therewith.

THE MARKET PRICE VERSUS THE INTRINSIC VALUE OF IDEAS.

Unfortunately this work of the association which constitutes at once its chief glory and its strongest claim to the gratitude both of humanity and of pharmacy has not proved sufficiently effectual when presented to the average pharmacist as a claim for his membership and financial support.

In the last analysis of things, ideas are greater than the materials which give them name and local habitation. According to Platonic philosophy, the external world is but the visible mantle of the ideal; the statue but the concrete expression of the higher and finer thing which first existed in the soul of its creator to which the material statue is no more than are the chalk lines to the geometer's angles which they represent. Behind the combination of mechanical powers which constitute the material locomotive, stands the ideal machine which had its first existence in the thought of the inventor, who is the true author of its being and not the mere mechanic who wrought and moulded the wood and metal into the visible reality of the thinker's ideal.

But while ideas lie at the bottom of all things, their market price is so frequently disproportionate to their intrinsic value that more than one thought which has served as the fulcrum for some world-moving lever has been the product of some unknown and unrewarded author. The thinker has his revenge in being the real ruler of men and nations, and the supreme arbiter of human destinies, even though unknown in the distribution of rewards and honors, and compelled to exercise his rulership through some proxy who flourishes on borrowed wisdom.

The appreciation of the value of an idea is the fruit of education and culture. The unthinking man appreciates only tangible things as a reward for effort; for him, things to be of consequence must possess corporal essence that can be seen and felt.

The impatience of the average American for immediate results, and the common disposition to ignore all values which can not be directly expressed in denominations of United States currency has rendered it difficult for this Association to impress the retail pharmacist with its importance to a sufficient extent to secure his active co-operation and championship.

That the beneficial effect of the Association upon his profession has been of great consequence he will usually admit without argument, and that the benefit of membership upon his business as a whole will return him many times the sum of his annual fee can be established by the testimony of a cloud of witnesses; but since we cannot, for example, make the specific promise that in return for his annual contribution of $5.00 we

will guarantee him an annual profit of $25.00 upon some particular article of trade upon which he now realizes nothing, or since we are unable to indicate the particular signals of the cash register which should be credited to the account of his membership, he too frequently thinks he has discharged the full measure of his obligation to the Association by vague expressions of good will and the hope for its continued prosperity.

THE PHARMACIST AND THE LAW.

Not the least important duty of our Association is to formulate and as far as possible to disseminate correct ideas concerning the pharmacist in his relation to the law, a subject that within the past few years has attained an importance almost vital to the existence of our vocation.

Upon the subject of legislation pharmacists are divided into two camps. On the one hand, it is said that there is already too much law affecting pharmacy; on the other that still more legislation is necessary. Both sides are right: there is too much that is bad, and not enough that is good.

The jurisprudence of pharmacy is in the process of evolution. The earlier enactments were largely experimental, and, like all experiments in legislation, defective. The old laws that are deficient and harmful must be corrected, and supplemented by new ones framed in the light of experience: but these measures must be closely studied and wisely planned, or they will intensify the very evils which they are designed to remove.

Doubtless it would be gratifying to know that our occupation was neither the subject of legislation nor likely to become such, but unfortunately this is not true. Adulteration, substitution, the use of preservatives, the sale of poisons and of narcotic drugs, are live questions. They are mentioned in every issue of the daily press, and whether we desire it or not, they will be the subjects of legislation for years to come. Conditions compel us to make a choice of two alternatives: either to stand quietly by and accept whatever the visionary reformer, the agricultural statesman, or the placeman scenting a job may choose to give us, or we must ourselves assume the leadership in effecting whatever changes should be made in the law so far as it concerns our business.

THE NATURE OF THE LAW.

The popular misconception as to the nature of the law is that it is a definite something that can be analyzed and accurately determined, like the active principle of a drug or the metallic base of a salt, provided the proper tests be applied. A brief examination of judicial decisions will show how wide of the truth is such a belief.

In fact, the law is what some man called a judge thinks it is, and moreover what the judge thinks is the law is so only as long as he thinks so, or until his superior judge thinks otherwise. The appellate court may to-day gravely deliver a dictum as expressing the law, and to-morrow, with equal gravity announce that yesterday's dictum was incorrect. The author of a law may think its language means one thing, and the appellate court decide that it means another quite different thing. To-day a given enactment of the legislature may be constitutional and valid; to-morrow the same enactment may be held unconstitutional and void.

And finally, when we have obtained the decision of the court of last resort and have acted upon it, we may learn to our sorrow that our interpretation of the court's interpretation has been erroneous.

In brief, a chain of decisions from the lowest to the highest is a series of more or less able guesses, the last one standing as final only because there is no higher tribunal remaining to take a hand in the hypothesis-framing, and until this arbitrary limit be reached one theory of the law's meaning is quite as probable as another.

Part of this uncertainty of the law is inevitable, and arises out of the inherent defects of human language as a vehicle for the conveyance of thought, and out of the fallibility

of human judgment. As long as human opinion remains the sole standard of right and wrong, and the standard must be applied by men of human passions and prejudices, the exact line of truth can never be determined with precision, and there must always be a wavering in the path traced by judicial decisions.

THE MANIA FOR LEGISLATION.

But this natural and inevitable uncertainty of the law is only a minor affliction when compared with the uncertainty arising from the multiplication of enactments upon all sorts of subjects and representing every degree of wisdom and unwisdom. We Americans apparently have the idea that it is possible to rid ourselves of all the ills which afflict us, either in flesh or spirit, by having the legislature adopt a fulmination against them with the great seal of state attached. If I can but make the laws of my country, I care not who breaks them, seems to be the motto of the average legislator. So well are we amused by the making of new laws that we have but little interest in the enforcement of the old ones, and perhaps it is well that we have not, for among the maze of conflicting and ill-considered measures it would puzzle the wisest to pick his steps without tripping.

Moreover, any restless member of the state has a chance to try his hand at law-making. Every man with a grievance, every reformer with a fancied mission, every dreamer with a scheme for reorganizing society upon a Utopian basis, can always find some complacent senator or representative to introduce a bill into the legislative machine that may chance to come out a law, so that we suffer the evils of the system of initiative and referendum without its possible benefits.

Approximately 40,000 separate bills are introduced during an average session of the National Congress, and probably a sufficient number in the various state legislatures to bring the total to 100,000 in each year, of which perhaps 15 per cent. become laws, a sufficient number for all of Anglo-Saxondom, with a liberal margin left over for the use of any other section of humanity that may be short on rules and regulations.

THE PURE FOOD AND DRUG LAWS.

Of very great importance to the pharmacist is that portion of the statute law relating to adulteration, and to the use of preservatives in articles of food and drink.

With the purpose and intent of these laws every honest man must be in sympathy: against the practical effect of some of them every intelligent man who is acquainted with the facts must protest.

The word adulteration has an ugly sound. To the ear of the public it suggests the practices of the cheat and the rascal, all of which are justly the subjects of righteous indignation.

Every addition to a drug or medicine, or to an article of food or drink, and every subtraction therefrom, the intent or effect of which is to deceive the purchaser or to defraud him of his money, or to induce him to pay a greater price than the article is worth, or which renders the substance less efficient as a medicine or less wholesome as a food, is a fraud and a wrong. Laws against such practices cannot be too severe nor too strictly enforced. In so far as the adulteration statutes accomplish these objects, they must command our hearty approval and loyal support.

In numerous instances, however, the meaning of the word adulteration has been expanded far beyond its ordinary and popular significance, and has been given an amplitude warranted neither by the dictionary nor by common sense. By mere legal definition alone, acts the most innocent, and not only innocent, but salutary, have been turned into crimes and made punishable as such. Some of the legal definitions of adulteration are such that the man who makes his product better than the legal standard by increasing its purity and strength, is in the eye of the law equally guilty with the man who dishonestly abstracts some valuable principle, or increases his profits by the addition of

some less valuable substance. And pharmacists not only may be, but actually have been arrested and held up to public scorn as criminals for furnishing articles better than the standard prescribed by the statute.

The intent of the public in lending its sanction to these laws is only to do justice and to protect itself against injury and fraud, but it is misled by technical terms, the meaning of which it does not understand, and which, if it did understand, it would repudiate. For example, if under the law which makes a bushel of coal to consist of 80 pounds, any official should prosecute the man who furnished 81 pounds for a bushel, that official would be overwhelmed by public indignation; but when a pharmacist is arrested for furnishing a drug of 81 per cent. strength when the standard is but 80 per cent., instead of sympathy he receives condemnation, because he is charged with the crime of adulteration, which in the public mind is always associated with dishonesty and wrong doing.

Again, when an edition of the Pharmacopœia has been adopted by law, that particular edition must continue as the standard until by a change of the law a subsequent revised edition is adopted. It thus sometimes happens that the legal standard of a state is a Pharmacopœia that has been superseded 15 to 20 years. Truly in such a case the pharmacist stands between his infernal majesty and the abysmal depths of the great sea. If he adheres to the standard set by the statute he violates professional ethics, betrays the confidence of the physician and endangers the life of his patrons. If he follows the Pharmacopœia in effect at the time, as in good conscience and honesty he should, then under the law he is guilty of the crime of adulteration and is liable to fine and imprisonment, and the ruin of his professional reputation.

Equally as foolish and hurtful, perhaps even more so, are the laws which specifically or in general terms prohibit absolutely the use of the preservatives afforded by modern science for the protection of certain foods and drinks against putrefaction and fermentation.

I believe that it may be asserted without fear of successful contradiction that not one well authenticated instance can be produced of injury resulting from the use of foods containing what may be termed the modern antiferments, when employed in no greater quantity than necessary to prevent decomposition; while on the other hand, myriads of cases might be cited of injury resulting from the use of foods decomposed through the lack of such protection. In a very liberal per cent. of cases where the certificate of the medical officer reads "died from natural causes," the true certificate would read, "poisoned by ptomaines administered in accordance with the statute in such case made and provided."

Furthermore, every theoretical argument that can be urged against the use of these modern preservatives on the ground of their being antiferments can be urged with equal force against common salt, vinegar and wood smoke, which have been used as food preservatives since prehistoric time.

The quintessence of the comic opera is absurdity, but what author of comic opera would have the temerity to represent a nation of 80 millions of alleged civilized people as employing an army of inspectors, chemists and other officers at an expense of hundreds of thousands of dollars annually to compel its citizens to eat ptomaine-poisoned food, and inflicting pains and penalties upon such manufacturers as dared to avail themselves of the resources of modern science to prevent such an evil?

As a matter of fact, our laws are exactly upside-down on the subject of preservatives. Instead of using the resources of government to hunt down and convict the manufacturer who uses a harmless antiferment in proper amount, they should be employed to detect and punish the man who is so careless of the public health as to send his products into the market without such an addition.

That there are preservatives that may be harmful in almost any quantity, and that others harmless in small amounts may be harmful in excessive amount goes without say-

ing, but surely it should be possible to draught laws against such evils without stretching the definition of adulteration to such an extent as to cause the infliction upon the public of greater evils than the laws prevent.

In view, therefore, of the great and constantly increasing importance of this subject to the practice of pharmacy, I recommend that the president be instructed to appoint, or that the Association or its Council select a committee of discreet and competent persons to take into consideration the legal definition of adulteration, especially as applied to the use of preservatives, and to report their conclusions at the next annual meeting of this Association; this report, when approved, to be made the subject of a communication to the general public, and to the governors of the various states, in order that the average citizen may have the opportunity of learning the facts concerning the use of preservatives.

When the average citizen comes to know that much of what is called adulteration is such only by virtue of false and stupid legal definition, and that much of the law for which he pays, and which purports to be for his protection, in fact harms him both in body and in purse, and is not infrequently used as the instrument of official graft and plunder, then, and not before, may we expect legislation that is rational and helpful instead of imbecile and damaging.

THE NEW ECONOMIC RULE OF COMPETITION.

Another point where the law touches the domain of the pharmacist is in its relation to contracts the object of which is to maintain remunerative prices upon certain products which are the subject of pharmaceutical commerce.

It was a cardinal principle of the old political economy, inherited from the Mediæval period, and endorsed alike by philosopher, statesman and judge, that the life of trade was found in unrestricted competition, and that any attempt to limit or regulate this contest, even in the slightest degree, was destructive of commerce and a crime against society.

But the rules of political economy, like the formal rules of grammar, are mainly matters of opinion, and must follow usage and experience instead of directing them. Modern commercial developments, by many a sore experience have taught us that competition when unregulated by the rules of prudence and common sense, ends naturally and logically in unrestricted monopoly. The favorite and most efficient device of the monopoly-seeking trust is to destroy the small producer and dealer by forcing upon them competition which they are unable to meet, and thereby secure to itself undisputed control of the whole field of production and supply.

The truth is that competition is the life of trade only as long as it operates to prevent exhorbitant profits: it is the destroyer of trade when it proceeds to such an extent as to make the conduct of a business utterly unprofitable.

But even if unregulated competition did not naturally gravitate toward monopoly, through the destruction of the dealer of small capital, it would not necessarily follow that the mere cheapening of prices to the consumer would be an unmixed blessing to the state. The producer and distributor are as much a part of the commonwealth and as much entitled to its consideration as the consumer.

The ideal community is not that in which goods are sold at the lowest prices, but that in which the greatest number of citizens are remuneratively employed and able to purchase goods at prices which will pay a fair profit to both manufacturer and distributor. The true rule of political economy is not one that considers the benefit of the consumer solely, at the expense of the producer and distributor, but one which considers the rights and prosperity of all three: and any form of contract or agreement which will secure to those who produce and those who distribute commodities a fair profit, and no more than a fair profit, is consonant with reason and justice, and should not be repugnant to law.

Slowly but surely the courts and political economists are coming to recognize this doctrine as sound. Not many generations ago it was a criminal offense for laborers to combine for the purpose of increasing their wages. But labor when it has a grievance against the law has a fashion of retorting with strikes and cobblestones, and carries its complaints to its representatives in the General Assembly. So complete has been its victory, that its right to fix its price is limited only by the sum which it may be able to extort from the necessities of its employer.

Is it too much, then, to hope that the producers and distributors of other commodities than labor will be permitted to secure to themselves, by general agreement or otherwise, such prices as will fairly remunerate them for the capital, skill, education and hazard involved in the conduct of their business.

The trend of modern legal decisions is all in this direction. Twenty-five years ago, if a druggist had contracted with a manufacturer not to sell his goods below a stipulated price the chances are that the first court to which the agreement was submitted would have declared it void as being in restraint of trade and contrary to public policy. To-day, by numerous decisions, the lower courts are upholding a direct contract and serial-numbering plan designed to maintain prices at a fairly remunerative point and there is strong ground for the hope that the courts of last resort will take the same just and reasonable view of the question.

THE GROWTH OF THE COMBINATION IDEA IN PHARMACY.

One of the most significant features of the wonderful commercial development of the past half-century has been the growth of the combination idea whereby individuals, weak in themselves, combine their efforts and resources for the accomplishment of large results not possible to individual effort.

This idea is seen at its best in fire and life insurance, in honestly conducted railroad enterprises, in the great manufacturing industries, and in intelligently directed labor organizations. It is seen at its worst in the monopoly-seeking trusts and corruptly governed trade unions, which use their enormous powers for wanton aggression upon the rights of others and for the exploitation of the general public.

The pharmacist has been among the slowest to awaken to a realization of the tremendous force of compact organization, and among the last to avail himself of its benefits.

In the not distant past, the pharmacists of America were as discoherent as a heap of sand. The retailers generally regarded the manufacturers and wholesalers as their natural and hereditary enemies, and these in turn looked upon the retailers as a class of men who neither knew what was for their benefit nor were capable of making a concerted effort to obtain it.

Not only were the retailers at war with the collateral branches of pharmacy, but among themselves as well. To the average pharmacist his neighbor in the next block was a proper subject of suspicion, to be closely watched, and whenever possible circumvented.

The great bulk of the trade was lethargic, careless, helpless, hopeless. Like an African with the sleeping-sickness, the craft seemed to be dozing into oblivion. That dispensing pharmacy had run its course as a profession, and that its practitioners were following the Dodo and village bootmaker into extinction was in many quarters confidently proclaimed.

The American Pharmaceutical Association was founded as a protest against this condition of disorganization, and for more than half a century it has persistently and without equivocation stood as the foremost champion of the combination idea as the only sufficient defense against destruction. Nor has it selfishly sought to aggrandize itself by monopolizing the field, but has constantly advocated the formation of pharmaceutical organizations in every part of the territory. It has ever stood, and to-day stands ready to strike hands and join forces with every organization, whether local or national, that seeks the betterment of pharmacy through legitimate channels and by honorable methods.

THE AWAKENING OF PHARMACY.

For a long time the effort of this Association to awaken the retail pharmacist to the importance of united effort was as the voice of one crying in the wilderness. At length, very slowly, so slowly in fact as to be at first imperceptible, the influence of this Association, together with the influences of the colleges and other associations which grew out of it began to have their effect, and the movement has grown in force and volume until to-day there are signs of activity everywhere. The sleepy Gulliver is at last beginning to waken and to snap the threads which have tied him fast. Every division of the field of pharmacy is being vigorously cultivated, and every day we hear of some new thing. We are perhaps too close to the scene of operations and too intimately connected with the action to appreciate the full significance of all that is taking place, but it is evident, to the most cursory inspection, that we are in the midst of changes which when accomplished mean no less than a revolution in the ancient order of things.

To give instruction in the necessity and art of combination as a means of preventing and removing abuses, and as an instrument for securing to the properly trained pharmacist an honest and adequate reward for his services, must be as important in our curriculum for the future as it has been in the past.

The everyday pharmacist must be taught that the exercise of an active interest in the work of the local and national associations and the contribution of his presence and annual dues to their success is as essential to his professional and business prosperity as it is that his place of business be regularly opened, that his stock be renewed and kept insured, that his assistants be competent, or that he attend to any of the other numerous details to which he addresses his daily attention.

Just as certainly as the citizen who holds himself aloof from political affairs will be punished for his neglect of the plain duties of citizenship by misgovernment and the evils resulting from political corruption, so will the pharmacist suffer loss of prestige and profit by neglecting to participate in the efforts of his fellow-craftsmen to elevate and reform the commercial and professional status of his calling.

THE A. PH. A. A CONNECTING LINK BETWEEN THE SEVERAL BRANCHES OF PHARMACY.

Not only does this Association advocate organization as a general policy, but by its peculiar constitution it operates to bring all the different branches of pharmacy into touch with each other, and to promote that good understanding and that professional good fellowship which invariably results in co-operation and enhanced prosperity.

It is necessary and proper that the retailers should have their distinctive organization through which they can act as a unit in agreements with the wholesalers and manufacturers, and it is equally necessary and proper that the manufacturers and wholesalers should each have their own particular associations to bring about unity of action and methods of agreement with the retailers. It is likewise quite appropriate that active membership in these respective organizations should be restricted to those engaged in the particular line which they are designed to represent.

The great opportunity of the American Pharmaceutical Association is found in the fact that it admits to membership the representatives of all the divisions of pharmacy, forbidding none and showing preference to none. It invites the workers in all lines to bring their contributions into the common stock for the common good.

It stands as the connecting link between all the various interests of pharmacy, and is the natural center of all other pharmaceutical organizations. Or, if we may be permitted to add still another ingredient to this metaphorical mixture, it constitutes a plexus which through its varied membership sends its nerves to the most distant members of the pharmaceutical body politic, tending to bring them into co-ordinate and harmonious activity.

SUGGESTIONS FOR A MONTHLY BULLETIN.

For some years past I have been constantly impressed by the fact that under present conditions the Association does not keep in sufficiently close touch with its members, and I deem it of great importance that some improvement be made in this respect.

Although the activities of the Association, through its committees and official staff, continue without ceasing, but one report a year is made to its general membership. As a consequence, the average member, especially if a non-attendant at the annual meetings, is unable to see or appreciate the enormous amount of work that is done in his behalf, and his interest is liable to slacken accordingly.

In my estimation the most serious want of the Association at the present time is some cheap, convenient and frequently issued medium which will enable its members to realize that they belong to a live and active organization, that will help them to increase their knowledge of its internal workings, and thereby stimulate their interest in its welfare.

Several methods of supplying this want have from time to time been proposed, perhaps the one most frequently suggested being the issue of a publication after the style of the well-known Pharmaceutical Journal. The objections to such an undertaking seem to me to be insuperable: the expense would be greater than our probable income would warrant, and it would besides bring the Association into a field already ably served, and also over-full. If this conclusion be correct, then the only remaining available means seems to be the issue of a monthly bulletin or circular, confined exclusively to the announcement of Association business.

The principal objection which has been offered to such a publication has been the difficulty of meeting the expense, but this might be largely or wholly offset by using the bulletin as the medium for the publication of a large amount of material which now appears in the annual proceedings.

The nature and scope of such a publication, as I have conceived it, is set forth in the following outline, which is herewith submitted for your consideration:

1. The publication to be known as The Bulletin of the American Pharmaceutical Association, to be issued monthly, and entered at the post-office as second-class matter.

2. The subject-matter to be restricted exclusively to Association news, not to contain advertising, and not to transgress upon the general field of pharmaceutical journalism.

3. The Bulletin to be sent to each member without cost, and to such pharmaceutical and medical publications as may make a request for the same. For those who desire it, a special binder, properly lettered, might be supplied at a nominal cost, to aid in the permanent preservation of the numbers.

4. As material which might properly be printed in such a bulletin, the following is suggested:

Announcements of the annual meetings, the issue of the bulletin containing such announcement to take the place of the circular commonly sent out for that purpose.

Reports of the Secretary, Treasurer, Council Secretary, Committees, and Necrological Reports.

Council Motions and Resolutions, Council Letters, General Announcements and Votes.

All other matters now found in the Proceedings, except the proceedings of the various Sections, and General Sessions, the Report on the Progress of Pharmacy, and such other matters as are properly included in a permanent record.

By relieving the Proceedings from the material which would be published in the bulletin, the former would be materially lessened in size and cheapened in cost.

The reports of financial and other matters which now are not read except by the few officers and the committees especially interested would be more largely studied and understood.

More important than all, it would constitute a monthly reminder to each member of the Association's existence and of his obligations to it.

ELECTIONS.

As a further means of stimulating the interest of the general membership in the work of the Association a change might be made in the manner of elections, so as to enable every member to participate in the selection of a part or all of the officers, in a manner analogous to the plan pursued by the American Chemical Society and other similar organizations. As a tentative plan, to be referred to the Council for revision, if the general principle is approved, the following is suggested:

1. At some convenient time, prior to the annual meeting, nomination blanks to be mailed by the General Secretary, calling for nominations to the various offices, and returnable by a certain date.

2. The nominations so made to be referred to a canvassing board of three members, who shall within a specified time certify the result to the General Secretary. The canvassing board should be authorized to omit from the certified list any nominees ineligible to election, and to fill vacancies in any list.

3. The certified list of nominees to be then submitted for a vote by mail, the returns referred to the canvassing board, and the result of said vote as determined by the board certified to the General Secretary.

While such change in the manner of conducting elections would place some additional work upon the shoulders of the General Secretary, and add somewhat to our expenses, I believe that the accruing advantages would supply an ample compensation therefor.

FOREIGN BRANCHES OF THE A. PH. A.

When the fathers of this Association laid its foundations they intended it to be catholic in purpose and continental in scope, and adopted for it a title which signifies that it does not regard international boundary lines. Unfortunately the magnificent distances of American geography have interfered to prevent a realization of this ideal.

But twice have we been able to meet outside the territory of the United States, while the distances to be traveled have been so great as to prevent Canadian members from being frequent visitors at our meetings, to the great detriment of the Association and of the great purpose for which it exists.

A finer race, whether considered intellectually, morally or physically, does not exist than that which inhabits the vast territory above the northern boundary of the United States, while the typical British American pharmacist is a credit to his vocation. Despite the politicians on both sides of the border, the people of British America and of the United States have a warm feeling of kinship and good-will for each other, while the pharmacists of both countries have the same ethical, commercial and professional problems to solve.

Since we cannot adapt the geography to suit our conditions, why should we not take a lesson from Mahomet, and adapt ourselves to the geography by establishing a section of this Association in British North America?

The section, if established, to do its best work should have its own official list and financial budget, and be co-ordinate in rank with the U. S. section. Each section should hold its own annual meetings, and conduct its own government. Periodically, say every ten years or so, the two sections might hold a joint meeting at some point most convenient to both.

The proceedings of the sections might be published together or separately as thought best. The Report on the Progress of Pharmacy to be supplied to the members of both sections, at pro rata cost according to membership.

While some difficulties would have to be overcome in arranging the details of such a

plan, there are none necessarily insurmountable, while its advantages, if successful, would be certain and considerable.

It would enable our Canadian brethren to realize that our Association was American in fact as well as in name, and would almost certainly result in a great increase in membership.

Should these views meet with the approval of the Association, I recommend that the General Secretary and such members as are residents of British North America be constituted a committee to consider the establishment of a section in that country and to report to the Council a plan for its organization and government, such plans to be put provisionally into operation when approved by the Council.

THE NATIONAL FORMULARY.

The most valuable commercial asset owned by this Association is the National Formulary.

The prime object in publishing this work was to furnish the professions of medicine and pharmacy with a list of tested formulas for meritorious preparations to replace as far as possible many of secret composition and doubtful merit which have been exploited by profuse advertising and detail visiting of physicians.

In point of merit the National Formulary satisfies nearly every requirement, but in this age of aggressive commercialism, merit alone is not sufficient to insure success, and whether measured by the extent of its circulation, by the use of its formulas by pharmacists and physicians, or by its financial returns to the Association, the popularity of the work has not been commensurate with the possibilities.

Unless the Association itself resolves to adopt more aggressive methods in pushing its sale and use, I suggest that the Council be instructed to invite propositions from responsible publishing houses for its publication upon such terms as will insure its most extensive circulation, together with the greatest financial return to the Association, either in the way of royalties or cash bonus, or both, at the same time preserving to the Association the full and untrammeled ownership of the copyright.

MEMBERSHIP.

Like all other voluntary organizations, this Association must rely upon the acquisition of new members to fill vacancies caused by deaths, resignations, and suspensions for nonpayment of dues. Not only are we under the necessity of keeping vacancies filled, but the magnitude of the work which this Association is attempting to perform, is such as to make it of great importance that our membership should be largely increased above the present number. Only a fraction of those who should give us the benefit of their experience and good counsel are found upon the roll of members. From a somewhat extended consideration of the subject I am led to believe that this is largely due to apathy on the part of those who are already members, and that with only a slight effort on the part of every member, our muster roll might within a very few years be trebled or even quadrupled.

From figures furnished me by Chairman Mittelbach, of the Membership Committee I learn that the total active and honorary membership in 1890 was 1321. From that date the number slowly increased to 1573 in 1895, then gradually declined to 1901, in which year it fell to 1240, the lowest point in fifteen years. Since then it has increased rapidly, reaching a net total of 1629, as shown by the roster in the Proceedings of 1904. The present year likewise shows a healthful and substantial increase. Should the net gain be equal to that of last year, the next volume of proceedings will show the largest number of members in the history of the Association. For this gratifying condition we owe much to the tireless energy of Chairman Mittelbach and his able colleagues on the Membership Committee. I am convinced, however, that a still more rapid growth is possible.

As a means of promoting this work, I suggest that in addition to the general membership committee, which should be left as it is at present constituted, the incoming president be instructed to appoint special membership committees, as follows: A committee whose special business it shall be to solicit members from the faculties and student bodies of the colleges of pharmacy, one to solicit members from the boards of pharmacy, one to canvass the state and local pharmaceutical associations, and one whose special duty it shall be to look after lapsed and suspended members. The number to constitute each of these special committees should not be fixed, but should be left to the discretion of the president.

My reason, in brief, for suggesting these additional committees is that the field from which members may be drawn is entirely too large to be thoroughly worked by the present Membership Committee. As it is, the burden upon the shoulders of the Chairman of that Committee is already very great, and should by no means be increased.

I may add that I have consulted Chairman Mittelbach upon this subject, and that he joins with me in recommending the creation of these special committees.

President Beal was repeatedly applauded during the reading of his address, and was most heartily applauded when he had finished. Mr. Beal explained that the recommendations he had ventured to make were virtually such as had been made by former Presidents, and probably contained more merit than if he had tried to submit something new.

On motion of Mr. Joseph L. Lemberger, of Pennsylvania, seconded by Mr. C. A. Rapelye, of Connecticut, the address of the President was ordered received and referred to a committee of three, to be appointed by the Chair, for consideration of the recommendations made, and report at a later session. The Chair appointed on said committee Messrs. Edward Kremers, of Madison, Wis.; Henry Kraemer, of Philadelphia, and R. G. Eccles, of New York.

President Beal resumed the Chair.

The Secretary called the list of Standing and Special Committees as follows, as notice to the Chairmen to have their reports ready for submission at the second general session on Tuesday:

Committee on U. S. Pharmacopœia—A. B. Lyons, Chairman.

Committee on National Legislation—F. C. Henry, Chairman.

Committee on Transportation—Chas. Caspari, Jr., Chairman.

Committee on National Formulary—C. Lewis Diehl, Chairman.

Committee on Organization of Local Branches of the A. Ph. A.—H. M. Whelpley, Chairman.

Committee on William Procter Monument Fund—John F. Hancock, Chairman.

Committee on Exhibition—Henry P. Hynson, Chairman.

Committee on Membership and Reception—Wm. Mittelbach, Chairman.

Committee on Status of Pharmacists in Government Employ—Geo. F. Payne, Chairman.

Committee on Weights and Measures—Frank G. Ryan, Chairman.

Committee on Drug Adulteration—E. L. Patch, Chairman.

The Secretary also called the following list of delegates to other bodies:

Delegates to Section on Pharmacology of the American Medical Association—Geo. B. Kauffman, Chairman.

Delegates to National Wholesale Druggists' Association—F. C. Godbold, Chairman.
Delegates to National Association of Retail Druggists—Otto F. Claus, Chairman.

Secretary Whelpley, of the Council, with permission of the Chair, then read an abstract of the minutes and a summary of the correspondence of that body from and including the third session of the Council at Kansas City in September of last year down to the present, the full text of the matter presented being as follows:

THIRD SESSION OF THE COUNCIL—SEPTEMBER 4, 1905.

The Council was convened at the Islesworth Hotel, Atlantic City, N. J., at 10:30 a. m., by Chairman J. H. Beal. The following members were present: Messrs. Beal, Candidus, Caspari, Jr., Diehl, Eberle, Ebert, Eliel, Gane, Hallberg, Hopp, Koch, Lemberger, Patton, Payne, Rapelye, Sheppard, Sherman, Whelpley and Wescott. The absentees were Mason, Meissner and Mittelbach.

Secretary H. M. Whelpley read the following Council correspondence, covering the period between the September 9, 1904, meeting at Kansas City and the present meeting at Atlantic City.

Eighteen new members were elected for the year 1904 and 147 for 1905, making a total of 165 to date compared to 124 the previous year.

September 14, 1904. It was moved by H. M. Whelpley and seconded by Charles Caspari, Jr., that William Carter Wescott, of Atlantic City, N. J., be elected local secretary for the 1905 meeting.

Motion carried.

October 8, 1904. It was moved by H. M. Whelpley and seconded by William Mittelbach that William Carter Wescott, the recently elected local secretary, be made chairman of the local committee of arrangements and instructed to appoint his own associates on the committee.

Motion carried.

It was moved by Albert E. Ebert and seconded by H. M. Whelpley that the committee on publication be instructed to publish a picture of Ezekiel Herbert Sargent as a frontispiece to the volume of Proceedings for 1904.

Motion carried.

November 3, 1904. In order to assist in keeping the expenses of the Association within the annual receipts for dues, it was moved by Charles Caspari, Jr., and seconded by S. A. D. Sheppard, that the annual award of general prizes be suspended for a period of five years and that no appointment of a committee on general prizes be made during that time.

Motion carried.

William Mittelbach moved and H. M. Whelpley seconded that President J. H. Beal be authorized to appoint such additional members in states or cities for the Committee on Membership and Reception as in his judgmeut will aid in securing new members and otherwise advancing the interests of the American Pharmaceutical Association.

Motion carried.

It was moved by J. H. Beal and seconded by H. M. Whelpley that the Chairman of the Committee on Membership and Reception be authorized to appoint solicitors in a series of cities which he may designate, the solicitors to act under the direction of some local member of the Committee on Membership and Reception.

Motion carried.

November 14, 1904. It was moved by John F. Patton and seconded by J. L. Lemberger, that the following financial budget for 1904–5 be adopted:

Salaries	$2,800 00
Proceedings	2,200 00
Printing and Stationery	250 00
Miscellaneous Expenses	175 00
Stenographer	200 00
Badges and Bars	40 00
Journals for Reporter on Progress of Pharmacy	50 00
Section on Scientific Papers	25 00
Section on Legislation and Education	20 00
Section on Commercial Interests	20 00
Section on Practical Pharmacy and Dispensing	20 00
Section on Historical Pharmacy	20 00
Premium on Treasurer's Bond	12 50
Insurance	20 00
Traveling Expenses	140 00
Total	$5,992 50

Submitted by Joseph L. Lemberger, Lewis C. Hopp, John F. Patton (Chairman), Council Committee on Finance.

Motion carried.

December 10, 1904. It was moved by J. F. Patton and seconded by H. M. Whelpley that the domestic pharmaceutical journals be given an opportunity to send their periodicals to the Reporter on Progress of Pharmacy complimentary to the A. Ph. A.

Motion carried.

It was moved by J. H. Beal and seconded by H. M. Whelpley, that the Secretary of the Council be authorized to furnish copies of the letters regularly presented to the Council, including motions proposed for adoption, and the records of votes upon the same, to such pharmaceutical journals as may desire to receive the same. Also, that the Secretary be instructed to withhold from such communications any portions of such Council correspondence which in his opinion it would be inadvisable to make public.

Motion carried.

January 4, 1905. Moved by Joseph L. Lemberger and seconded by H. M. Whelpley, that the matter of exhibits at the meeting of the A. Ph. A. to be held at Atlantic City, be left entirely to the good judgment of the local committee on arrangements, of which the local secretary is chairman.

It was moved by William Mittelbach, seconded by H. M. Whelpley, that the following resolution be adopted:

WHEREAS, The American Pharmaceutical Association at its meeting of 1903, held at Mackinac, Mich., adopted the report of the Auxiliary Committee on Membership, in which report it was recommended that a sum not exceeding $1.00 on each new member secured be allowed said committee as expense in the prosecution of its work; and

Whereas, At the Kansas City meeting this year, the said Auxiliary Committee on Membership reported two hundred and thirty (230) new members duly elected, therefore,

Be it resolved by the Council that the sum of $230.00 be and is hereby appropriated out of the general fund of the Association and placed to the credit of said Committee to be used by same as expenses in the prosecution of its work.

Motion carried.

Moved by H. M. Whelpley, and seconded by William Mittelbach, that six bound copies of the Proceedings for 1902 be placed at the disposal of the Committee on Membership for used in canvassing for new members. It is understood that these volumes are to remain the property of the Association.

Motion carried.

January 20, 1905. The following was offered as a substitute for the motion which referred the matter of exhibits to the Local Committee on Arrangements.

It is moved by J. H. Beal, and seconded by H. M. Whelpley, that:

WHEREAS, For the purposes of interesting visiting pharmacists, making the public better acquainted with the achievements and progress of pharmacy, associated industries, and, incidentally, providing additional funds for the Association, it seems desirable that a popular exhibition of drugs, pharmaceuticals and pharmacists' supplies be held during the next meeting of the Association at Atlantic City; therefore, be it

Resolved, That the President of this Association is hereby authorized to appoint such, and as many members of this Association as he may deem proper, as a Special Committee to provide for, manage and conduct for this Association such an exhibition as this Committee may deem proper, provided the general plan and policy shall he acceptable to the Council; and be it further

Resolved, That the President, General Secretary and Secretary of this Council be hereby constituted a special body with full power to act for this Council in all matters pertaining to the proposed exhibition; and be it further

Resolved, That one hundred dollars, or so much as may be needed, is hereby authorized to be paid by the Treasurer to the Chairman of the Special Committee on Exhibition, to be used in meeting the preliminary expenses of the Committee.

In submitting the above motion, President Beal gives as his reason the amount of work required to make a successful exhibition, and states that it is greater than should be placed upon the Local Secretary and his associates in addition to the Local Committee's work of arranging for the annual meeting.

Motion carried.

The following motion offered by Harry B. Mason was seconded by H. M. Whelpley:

We have now passed in the Council two or three motions concerning the report of the Committee on Time and Place of Next Meeting. We have still to act on the third recommendation of the Committee, namely that entertainments at the Atlantic City meeting be entirely restricted to the evening periods. I am opposed to this recommendation, and I desire to bring it before the Council in some way so that the matter may be settled by vote. I move, therefore, that the arrangement of the program be turned over to the customary sub-committee comprising the General Secretary, the Local Secretary and the Secretary of the Council; that this Committee refer the program back to the Council for adoption at the proper time, and that in devising the program the Committee shall not make provision to have all entertainments given in the evening.

Motion carried.

The following motion offered by J. L. Lemberger was seconded by H. M. Whelpley:

That the customary sub-committee on program (General Secretary, Local Secretary and Secretary of the Council) be authorized to set apart as many hours during the day as in their best judgment will be appropriate to enable members and their friends to enjoy the attractions of Atlantic City, and upon such days there shall be an evening session to transact the business of the section or general session.

Motion carried.

RESOLUTIONS UPON THE DEATH OF THE LATE DR. FRIEDRICH HOFFMANN.

February 17, 1905. Chairman Beal of the Council appointed the following Committee to prepare suitable resolutions upon the death of the late Dr. Friedrich Hoffmann and to report the same to the Council at an early date: Edward Kremers, Wisconsin, Chairman; Henry M. Whelpley, Missouri; C. Lewis Diehl, Kentucky.

President Beal appointed the following Special Committee on Exhibition:

Henry P. Hynson, Chairman, Baltimore, Md.; John G. Godding, Boston, Mass.; W. C. Anderson, New York City; W. L. Cliffe, Philadelphia, Pa.; Lewis Emanuel, Pittsburgh, Pa.; Alfred DeLang, Cincinnati, O.; H. F. A. Spilker, St. Louis, Mo.; Eugene R. Selzer, Cleveland, O.; F. S. Hereth, Chicago, Ill.; Joseph Helfman, Detroit, Mich.; F. C. Godbold, New Orleans, La.; George F. Payne, Atlanta, Ga.; T. A. Miller, Richmond, Va.; F. C. Henry, Washington, D. C.; John A. Davis, Baltimore, Md.

It was moved by S. A. D. Sheppard and seconded by Charles Caspari, Jr., that there be a special appropriation of $225.00 for certificates.

This will cover the cost of 200 blank parchment certificates the expense of changing the plate and engrossing certificates for the ensuing year.

Motion carried.

In accordance with the recommendation of President Hopp, approved by the Committee on President's Address and referred to the Council by a vote of the Association, the Chairman of the Council offered the following resolution:

RESOLVED, That the President be authorized to appoint a Special Committee of Publicity, to act until the meeting of the Association at Atlantic City, in September, 1905, and to report at that meeting upon a plan for the organization and work of a committee of publicity as a standing committee of the Association.

Motion carried.

March 21, 1905. Mrs. Albert B. Prescott desires to express to the president and members of the American Pharmaceutical Association her sincere appreciation of their kindness and sympathy in her bereavement and for the exquisite wreath of flowers.

It was moved by J. H. Beal and seconded by S. A. D. Sheppard that the secretary be instructed to send copies of the current issue of the Proceedings to new members who have completed their membership since the close of the last financial year and prior to the issue of the current volume, without cost to such members.

Motion carried.

President James H. Beal offered the following resolution: "That the local secretary and committee be requested to submit to the Council, not later than the first day of May, a provisional program of the sessions of the Association and its Sections, and of the entertainments proposed for the meeting of this Association at Atlantic City."

"The object in asking for the submission of the program at such an early date is to afford the members of the Council and others an early opportunity for discussion and for such amendments as may be deemed necessary."

Motion carried.

April 21, 1905. The president appointed the following committee on the United States Pharmacopœia. The committee will elect its own chairman. A. B. Lyons, Charles E. Caspari, C. S. N. Hallberg, George H. Beringer, E. L. Patch, E. G. Eberle, L. F. Kebler, Thomas F. Cook, Reid Hunt, Smith E. Jelliffe.

The president announced that the following schools and colleges of pharmacy have decided to offer as an annual prize to some meritorious member of the senior class a nomination to membership in the A. Ph. A., and the first year's fee of $5.00:

Ohio State University, Department of Pharmacy, offered by Professor George B. Kauffman.

Pittsburg College of Pharmacy, one nomination and fee, offered by Professor J. A. Koch. One nomination and fee offered by Dr. J. H. Beal.

University of Michigan, Department of Pharmacy, one nomination and fee, offered by Professor J. O. Schlotterbeck.

Scio College of Pharmacy, one nomination and fee, offered by Dr. J. H. Beal.

The president appointed the following Committee of Publicity: H. M. Whelpley, W. R. Ogier, H. B. Mason, E. J. Kennedy, Henry Kraemer, C. A. Mayo, G. E. Gibbard, G. P. Engelhard, R. G. Eccles, Edward Kremers, Frank L. James, Francis B. Hayes (Chairman).

The instructions to the committee were to suitably advertise the forthcoming meeting and to report at the Atlantic City meeting a plan for the organization and work of a permanent Committee on Publicity.

May 11, 1905. President Beal announced that in addition to the colleges before mentioned the Atlanta College of Pharmacy will give annually to some member of the senior class the membership fee and the recommendation for membership in the A. Ph. A.

It was moved by H. M. Whelpley and seconded by William Mittelbach that an appropriation of an additional sum of $75.00 be made for the purpose of paying for additional printing and stationery.

Motion carried.

It was moved by H. M. Whelpley and seconded by William Mittelbach that the General Secretary be instructed to order thirty gold badges, and that an appropriation of $60.00 be made to cover the expense of the badges.

Motion carried.

The expenditures for publication and delivery of the Proceedings being in excess of the appropriation made for the purpose for the current year, it was moved by Charles Caspari, Jr., and seconded by S. A. D. Sheppard that an additional sum of $650.00 be appropriated for the payment of bills on account of the Proceedings for 1904.

The Committee on Publication, through its chairman, omitted from the 1904 Proceedings 86 pages of the Appendix and Prefatory matter, heretofore annually published, and reduced the space required for printing the report of the fifty-second annual meeting to the extent of 115 pages as compared with last year, but the report on the Progress of Pharmacy for 1904 is larger by 108 pages than for 1903, which, together with the increased number of books required for the present membership, has swelled the expenses beyond the original estimate.

Motion carried.

To the Members of the Council of the American Pharmaceutical Association: We, the undersigned, Chairman of the Finance Committee and Treasurer, know the amount of the advanced dues received for 1904, also what are the receipts and expenses of the Association for the present fiscal year up to May, 1905.

The income from the Procter Fund (formerly the Life Membership Fund) is included in the receipts. We have estimated the receipts and expenses for May and June, and we find there will be a probable deficit of about $200.00 at the end of the fiscal year, July 1, 1905.

Chapter 6, Article 1, of the By-Laws reads in part as follows: "The business of the Association which is not of a scientific character shall be in charge of a council, which is empowered" . . . . "to reduce any appropriations that have been made whenever, in their judgment, the current receipts are not sufficient to allow the expenditure."

We have studied the matter carefully, and in our judgment the Council should now exercise the authority given it in this By-Law and take action to reduce expenses for this fiscal year. We find only one appropriation that can be reduced, the appropriation for salaries, $2,800.00. We recommend that it be reduced 10 per cent., and herewith offer a motion to that effect. We realize the gravity of the proposed action, but we believe it necessary, and trust the motion will receive the unanimous support of the members of the Council.

Motion carried.

June 7, 1905. In addition to the colleges already announced, the College of Pharmacy, State University of Iowa, offers nomination for membership and first year's dues in the A. Ph. A., the prize being offered by Professor Wilbur J. Teeters.

The St. Louis College of Pharmacy offers nomination for membership in the A. Ph. A. and first year's dues to the member of the graduating class making the third best general average on the examination for graduation.

The New Orleans College of Pharmacy will also present as a prize one nomination to membership and one year's dues.

The Cleveland School of Pharmacy offers nomination for membership and two years' dues in the A. Ph. A. for the best general average in materia medica, prize being given by Professor William H. Haake.

The Baylor University College of Pharmacy, Dallas, Tex., offers nomination for mem-

bership and one year's dues for the best average in theoretical and practical pharmacy The prize is awarded by Professor E. G. Eberle.

The National College of Pharmacy, Washington, D. C., offers annually one nomination to membership in the A. Ph. A. and one year's fee. Dr. Murray Galt Motter presents the prize.

It was moved by C. Lewis Diehl and seconded by H. M. Whelpley that the following report be adopted:

REPORT OF COMMITTEE ON DR. HOFFMANN RESOLUTIONS.

In the death of Dr. Frederick Hoffmann the American Pharmaceutical Association has lost one of her honorary members and American Pharmacy one of her staunchest advocates of professional advancement.

Born and educated in a country in which pharmacy had advanced to a high plane under government control, he naturally had little sympathy for the *laissez faire* policy of the country of his adoption. Nevertheless, he did more than merely to find fault with the conditions as he found them. As a pharmaceutical practitioner he set an example to thousands of others who constitute the rank and file of our profession. As a leader of his fellow-druggists he demonstrated greater courage in action than any of his colleagues when the independence of his profession was threatened. Greatest of all, however, was the influence he wielded with his pen, especially as editor of the journal which he founded.

It was inevitable that such a character as his should occasionally wound where he desired merely to correct. All the greater, therefore, was the appreciation of his services when the American Pharmaceutical Association selected him as the principal speaker at the fiftieth anniversary held in Philadelphia in 1902. How greatly he prized this honor was clearly shown when he, though very feeble in health, crossed the Atlantic in response to the invitation. Still greater was his disappointment to be compelled on account of illness to return to Europe without having fulfilled the engagement.

In appreciation of his lasting services to American Pharmacy, be it therefore

Resolved, That the American Pharmaceutical Association give public expression to its sense of loss in the death of Dr. Frederick Hoffman: and be it further

Resolved, That a copy of these resolutions be sent to the widow of the deceased who has been a faithful companion to him during a long life of labor which will be appreciated more and more as time passes.

H. M. Whelpley,
C. Lewis Diehl,
Edward Kremers, *Chairman*.

Motion carried.

It was moved by H. M. Whelpley and seconded by Charles Caspari, Jr., that the following report be adopted:

REPORT OF COMMITTEE ON DR. PRESCOTT RESOLUTIONS.

Whereas, The American Pharmaceutical Association has suffered a severe loss by the death, on February 28, 1905, of its former President, Albert Benjamin Prescott, and

Whereas, The American Pharmaceutical Association wishes to express its sorrow in the loss of an esteemed and beloved member who has efficiently and wisely served as its President, Chairman of the Council and on various committees; be it therefore,

Resolved, That in the death of Dr. Prescott, Pharmacy at large has lost a true and devoted servant, who, by introducing laboratory methods of instruction and by demanding higher entrance and curriculum standards in pharmaceutical education, has exerted an influence for the elevation of our calling that can scarcely be overestimated; be it further

Resolved, That by his singular modesty, gentleness of character, purity of motive and catholicity of spirit he has endeared himself to all with whom he came in contact, and that his example will ever be an inspiration for good.

Resolved, That a copy of these resolutions be transmitted to the bereaved family together with an expression of our profoundest sympathy in this time of trial.

Charles Caspari, Jr.,
Joseph Helfman,
J. O. Schlotterbeck, *Chairman*.

Motion carried.

A vote was called for on the proposed program for the Atlantic City meeting.

July 11, 1905. It was moved by John F. Patton that the following financial budget of expenses of the A. Ph. A. for 1905–6 be adopted. Seconded by Lewis C. Hopp.

Certificates	$15 00
Committee on Membership	225 00
Salaries	2520 00
Printing Proceedings	2400 00
Printing and Stationery	300 00
Miscellaneous	300 00
Stenographer	200 00
Badges and Bars	30 00
Journals for Reporter on Progress of Pharmacy	30 00
Section on Scientific Papers	40 00
Section on Education and Legislation	30 00
Section on Practical Pharmacy	30 00
Section on Historical Pharmacy	30 00
Premium on Treasurer's Bond	12 50
Insurance	25 00
Traveling Expenses	150 00
Section on Commercial Interests	30 00
	$6387 50

Motion carried.

August 19, 1905. Chairman Beal announced a committee consisting of Leo Eliel (Chairman), H. M. Whelpley and L. E. Sayre to prepare resolutions on the death of ex-President William Simpson.

It was moved by H. M. Whelpley and seconded by William Mittelbach that the Secretary be authorized to have forty gold bars made for the Atlantic City meeting.

Motion carried.

The following report was submitted by a Special Committee, consisting of H. M. Whelpley (Chairman), William Mittelbach and Edward Kremers:

Mr. Christian F. G. Meyer, of St. Louis, died, July 12, 1905, while traveling with Mrs. Meyer in Germany. Mr. Meyer joined the A. Ph. A. in 1860 and was one of the oldest members of the organization. He learned the retail drug business at Fort Wayne, Ind., when a young man, and became proprietor of a drugstore at that place before he was of age. He entered the wholesale drug business in St. Louis in 1865.

Many lessons may be drawn from Mr. Meyer's busy and exemplary life. During all of his activities as a retailer, wholesaler, manufacturer and writer, he constantly kept in view the betterment of pharmacy, giving particular attention to the advancement of pharmaceutical education. Mr. Meyer attended several meetings of the A. Ph. A. His personality was such that here, as elsewhere, he endeared himself to all whom he met.

Resolved, That in the death of Mr. C. F. G. Meyer the American Pharmaceutical Association in particular and the entire drug interests of the country at large have lost a valued worker and leading spirit: and be it further

Resolved, That a copy of these resolutions be sent to the widow of the deceased, who was for more than half a century his companion and help-mate.

Resolutions adopted.

On motion by S. A. D. Sheppard, the Council dispensed with the reading of the published minutes of the session held at Kansas City.

On motion of Leo Eliel, the Council approved of the manner in which Treasurer Sheppard has recorded the Dr. M. G. Motter college prize fund.

On motion of C. Lewis Diehl, the General Secretary was instructed to place $2000.00

insurance on the Association property, which is now stored by the Security Storage Company, of Baltimore.

On motion by L. C. Hopp, the following was adopted:

Resolved, In view of the fact that schools of pharmacy are now giving A. Ph. A., membership prizes, we recommend that the Association have prepared blank certificates setting forth the meritorious work of the students receiving the same, said certificate to be sold to colleges of pharmacy at about cost; said certificate is not to be a certificate of membership from our Association, but a certificate from the institution giving the same, setting forth that ——— has received a membership in the A. Ph. A.

On motion by S. A. D. Sheppard, the dues of William E. Capper, of Boston, to July 1, 1905, were remitted.

On motion by S. A. D. Sheppard, L. E. Dougherty was made a life member, old style, without the proceedings.

The following report of the secretary of the Council and secretary of the Committee of Membership, H. M. Whelpley, was read and, on motion, adopted.

REPOPT OF THE SECRETARY OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the A. Ph..A:

The new method of electing members during the interval between annual meetings (see Article II. of Chapter VII. of the By-Laws) has been on trial sufficiently long to prove the wisdom of the practice.

Chairman William Mittelbach, of our committee, will submit a detailed report of the present membership and the changes during the past year.

The form of completion blank submitted in my last annual report (see Proceedings, 1904, page 16) has proven satisfactory.

Duty will not permit me to close this report without reminding you that

> " Death is the port where all may refuge find,
> The end of labor, entry into rest."

The last year has led to this rest some of the noblest, most useful and beloved members. The list of deceased members since my last report is as follows:

Name.	Address.	Joined.	Died.
Aimer, Charles Pons,	Charleston, S. C.,	1879	Mar. 8, 1905
Byrne, John,	Columbus, O.,	1893	June 1, 1905
Brown, William T.,	Madison, N. J.,	1894	Aug. 26, 1904
Devine, John,	Santa Montica, Cal,.	1887	
Graf, Carl A.,	Salina, Kans.,	1901	June 27, 1904
Hanrath, Fred R.,	St. Louis, Mo.,	1904	
Harbaugh, Duncan J.,	Haverford, Pa.,	1902	July, 1904
Hoffmann, Frederick	Berlin, Germany,	Hon. Mem.	Nov. 30, 1904
Howard, Fletcher,	Des Moines, Ia.,	1895	Mar. 10, 1904
Meyer, C. F. G.,	St. Louis, Mo.,	1860	July 12, 1905
Nattans, Arthur,	Baltimore, Md.	1883	Apr. 16, 1904
Prescott. Dr. A. B.,	Ann Arbor, Mich.,	1871	Feb. 25, 1905
Renshaw, Thomas W.,	Lansford, Pa.,	1901	Sept. 29, 1904
Schmidt, Chas.,	Baltimore, Md.,	1902	Aug. 15, 1905
Simpson, William,	Raleigh, N. C.,	1873	June, 1905
Snyder, Henry N.,	Lancaster, Pa.,	1904	Jan. 10, 1905
Wood, Edward S.,	Boston, Mass.,	1879	July 11, 1905

On motion by L. C. Hopp, it was decided to publish the list of the deceased members on a memorial page, giving dates of birth, joining the A. Ph. A., entering upon apprenticeship, college of pharmacy graduation and the business location.

On motion by P. C. Candidus, applicants No. 148 to 174 inclusive, were duly elected.
On motion by E. G. Eberle, the Council adjourned, subject to the call of the Chair.

After Secretary Whelpley had called the attention of the members who had not already done so at some previous meeting to the necessity of signing the book containing the Constitution and By-Laws of the Association,—a book which dated back almost to the very beginning of the Association,—and also to the official badge of the Association and the gold bars for the Atlantic City meeting, which could be had at the desk of the Secretary, the Chair called for action on the minutes of the Council just read, and Mr. Main moved to receive and adopt as read. Mr. Hallberg, of Chicago, arose to a point of personal privilege, and explained that he had cast a solitary vote in the Council against the acceptance for membership of a certain proprietor of a secret cough remedy, whose name had been proposed, and he desired to protest most earnestly against the election of such a person as a member of the American Pharmaceutical Association, as in direct contravention of the purpose of the organization as declared in its Constitution, which says its object shall be "to suppress empircism and quackery." Mr. Hynson, as endorser of the gentleman proposed for membership, stated that he was quite sure he would not desire to be a member of the Association unless he was thoroughly acceptable to every one, and begged that his case be referred to a special committee of three, to be appointed by the Chair, for consideration and report at a subsequent session. This motion, seconded by Mr. W. C. Anderson, was put and carried. The Chair appointed on said committee Messrs. Hynson, of Baltimore, Sheppard, of Boston, and Payne, of Atlanta. The motion made by Mr. Main to adopt the minutes of the Council was then put and carried.

The report of the Committee on Exhibition was called for and Chairman Hynson made report as follows:

REPORT OF THE COMMITTEE ON EXHIBITION.

For the Committee on Exhibition, I beg leave to report that the hall will be open tomorrow, Tuesday morning, and that 27 displays will be in place, the gross receipts from which will amount to $1,130.00. Deducting the expenses, which will be less than $100.00, will leave, approximately, $1,000.00 as the proceeds accruing from this feature of the present meeting. As soon as all dues are collected and bills are paid, a detailed account will be rendered and the balance paid the Treasurer.

The thanks of the Association are generously due Messrs. Osborne and Painter, proprietors of this hotel, for the free use of the splendid exhibition hall, and for many other courtesies and favors shown this Committee. The concession of the hall is all the more valuable because there are so few available places in Atlantic City, and because efforts to obtain a fit place had been attended with much difficulty. The Association should be especially grateful also to all those who have been kind enough to take part in the exhibition, for it is a truth that a number have done so solely because of a desire to help us. A list of the exhibitors accompanies this report, and it is hoped that all attending this meeting will show their appreciation by making frequent visits to the several displays, and by giving them that interested attention they seem to deserve.

The comparatively large amount expended for postage, $18.00, will show at once that the patronage secured was obtained through the sending out of a very large number of circulars, and the writing and mailing of many letters. Attention is called to this for the encouragement of our successors.

The non-participation of many prominent manufacturers, jobbers and importers who have heretofore been quite active in the affairs of the Association is disappointing and unfortunate, and, for future guidance, it may be truly said that pharmaceutical exhibitions are not popular with these. It will be well, therefore, when contemplating the holding of such exhibitions to ascertain the sense of those from whom support may naturally be expected before decided action is taken.

LIST OF EXHIBITORS.

Borden's Condensed Milk Company, McKesson & Robbins, Eli Lilly & Co., Moses Sons & Co., Lehn & Fink, Lea Bros. & Co., Welch Grape Juice Company, Wm. R. Warner & Company, Hall & Ruckel, Smith, Kline & French Co., Horlick's Food Company, P. Blackiston, Son & Co., Douglas Manufacturing Company, Swindell Bros., American Peroxide & Chemical Co., Mellin's Food Co., Thermalite Company, Hance Bros. & White, S. H. Wetmore & Co., G. B. Underwood Inspirator Co., Peerless Tube Co., Appert Glass Company, Merck & Co., The Flaccus Glass Co., The J. B. Lippincott Co., Pond's Extract Co., Mecklenberg Mineral Springs Co., Major's Cement.

Respectfully submitted for the Committee, H. P. HYNSON, *Chairman.*

The report was greeted with hearty applause.

Mr. Hynson added that he would take it as a personal favor if the members present would show some appreciation of the efforts of the exhibitors to make an attractive display, and he thought a great many of the active pharmacists present would be interested in the wares they had to present.

On motion of Secretary Caspari, a recess of five minutes was taken, to permit the members from the various States, Territories and Provinces to confer in regard to the selection of members upon the Nominating Committee. After the convention had been called to order again, the Secretary called the roll of the States, Territories and Provinces, and the Nominating Committee was made up as follows:

NOMINATING COMMITTEE.

Alabama—P. C. Candidus.
Arkansas—L. J. Kosminsky.
Connecticut—C. A. Rapelye, J. K. Williams.
District of Columbia—Reid Hunt, L. F. Kebler.
Florida—E. Berger.
Georgia—Geo. F. Payne.
Illinois—C. S. N. Hallberg, W. A. Puckner.
Indiana—Leo Eliel, A. Timberlake.
Iowa—Mrs. Fletcher Howard.
Kentucky—C. Lewis Diehl.
Maryland—J. F. Hancock, W. C. Powell.
Massachusetts—J. G. Godding, S. A. D. Sheppard.
Michigan—H. B. Mason, J. W. T. Knox.
Mississippi—O. W. Bethea, J. R. Humphreys.
Missouri—Chas. E. Caspari, H. M. Whelpley.
Nebraska—A. V. Pease, Chas. R. Sherman.
New Jersey—W. C. Wescott, R. B. Gable.
New York—A. B. Huested, W. C. Anderson.
North Carolina—E. V. Zoeller, F. W. Hancock.
Ohio—C. G. Merrell, W. H. Haake.
Pennsylvania—C. B. Lowe, Jno. F. Patton.
South Dakota—I. A. Keith, E. C. Bent.
Tennessee—J. T. McGill.
Texas—E. G. Eberle.
Vermont—W. H. Zottman, Z. B. Hopkins.
Washington—C. W. Johnson.
Wisconsin—Edward Kremers.
Indian Territory—H. D. Kniseley.
Oklahoma Territory—F. B. Lillie.
Province of Ontario—Jno. Hargreaves.
Foreign Countries—N. H. Martin.

The President then added the names of the following members to represent the Association at large: Joseph L. Lemberger, of Pennsylvania; Albert M. Roehrig, of New York; Chas. Holzhauer, of New Jersey; Thos. F. Main, of New York; A. E. Ebert, of Illinois.

On motion of Mr. Sheppard, the Nominating Committee was instructed to meet immediately after the adjournment of this session. Mr. Whelpley thought the committee should meet in the council room, and moved a reconsideration of the vote just taken to that effect, but there was objection on the part of some of the members on account of the size of the room, and the Chair expressed the opinion that it would be best to let the committee meet in the convention hall and adjourn to some other room, if it was deemed desirable, and this course was pursued.

The chair announced the following Committee on Time and Place of Next Meeting: Messrs. A. E. Ebert, of Chicago; C. G. Merrell, of Cincinnati; F. E. Stewart, of New Jersey; C. A. Mayo, of New York, and F. C. Godbold, of New Orleans. Two communications in the hands of the Secretary, extending invitations to the Association for next year's meeting, were referred to the committee just appointed.

There being no further business before the Association at this session, on motion of Mr. Sheppard the Association then adjourned to 10 o'clock to-morrow morning.

SECOND SESSION—TUESDAY MORNING, SEPTEMBER 5, 1905.

The Association was late in assembling, owing to a protracted session of the Council, and was not called to order by President Beal until 11:15 a. m.

As the first order of business the Secretary read the minutes of the first session, which, on motion of Mr. Anderson, of Brooklyn, were approved as read.

The report of the Nominating Committee was called for, and Mr. Hallberg, of Chicago, read the report as secretary of the committee. Applause greeted the committee's selection for the various offices as the names of the nominees were read. After one or two slight corrections had been made, Mr. Brundage, of New York, moved to accept the report as amended. The report then stood as follows:

REPORT OF THE NOMINATING COMMITTEE.

To the President and Members of the American Pharmaceutical Association:

Your Nominating Committee beg leave to report that they have voted to recommend the following-named members for election as officers for the ensuing year:

For President—Joseph L. Lemberger, of Pennsylvania.

For First Vice-President—Chas. Holzhauer, of New Jersey.

For Second Vice-President—Chas. A. Rapelye, of Connecticut.

For Third Vice-President—F. C. Godbold, of Louisiana.

For Treasurer—S. A. D. Sheppard, of Massachusetts.

For General Secretary—Chas. Caspari, Jr., of Maryland.

For Reporter on the Progress of Pharmacy—C. Lewis Diehl, of Kentucky.

For Members of the Council for Three Years—Jas. H. Beal, of Ohio; Wm. Mittelbach, of Missouri; A. M. Roehrig, of New York.

Respectfully submitted,

WM. C. ANDERSON, *Chairman*,
C. S. N. HALLBERG, *Secretary*.

Mr. Eliel, of South Bend, Ind., moved to amend the motion to accept by the addition that the Secretary be directed to cast the affirmative ballot of the Association for the Committee's nominee for President, Mr. Joseph L. Lemberger, of Pennsylvania. The motion as amended was carried unanimously; the Secretary announced that he had cast the ballot as directed, and the Chair declared Mr. Lemberger duly elected President of the American Pharmaceutical Association for the ensuing year. (Applause.)

Mr. Hallberg, of Chicago, was designated to cast the vote of the Association for the remaining nominees on the committee's list. He announced that he had performed this duty, calling the names of the nominees as shown in the report, and the offices they were to fill, and the Chair declared these gentlemen duly elected to the offices set opposite their names. (Applause.)

Mr. H. M. Whelpley, Secretary of the Council, read the minutes of the fourth session of that body, held this day.

FOURTH SESSION OF THE COUNCIL.

Chairman J. H. Beal called the Council to order at 10:15 a. m., September 5, 1905, a quorum being present.

On motion, applicants Nos. 155 to 186 inclusive were duly elected to membership.

On motion, Theodore F. Hagenow was reinstated with original date of membership, and the General Secretary instructed to furnish him with proceedings.

The following amendment, offered by C. S. N. Hallberg, was duly carried. Amend Chapter VII, Article 1, by dropping out the last two lines. Amend Chapter VII, Article 3, by changing the word "three" to the word "two," in the second line, so that it will read "two successive years."

The following report of the General Committee on Membership and Reception was read and, on motion, adopted:

REPORT OF THE GENERAL COMMITTEE ON MEMBERSHIP AND RECEPTION.

Following the recommendation of this committee in its report at the Mackinac meeting, President Beal named the Chairman and most of the other members of the committee before adjournment at Kansas City last year. This enabled the committee to organize early, and by Oct. 1st most of the members were notified of their appointment and work assigned them. The plan of the preceding year was again followed, and applications, as soon as received, sent to the Council for election. In this way the number of new members secured was raised from 200—the number elected by the close of the Kansas City meeting—to 218 by Jan. 1, 1905. About that time the Council appropriated $230 to meet the expenses of the committee; said amount to include $13.50 paid Secretary Whelpley for blanks and other printed matter used by the committee, and $93.50 expended by the committee in the past year. Close economy was practiced throughout these two years, and expenses held within the appropriation. At

this writing there is still an unexpended balance of $13.82, which amount however may be claimed as commission by members working on such basis.

Up to date 147 new members have been elected. Last year the committee reported 94 for the same length of time. Between Sept. 1, 1904, and the close of the Kansas City meeting 107 additional members were enrolled, bringing the total, including those elected before the end of the year, to 218. If we do as well at the Atlantic City meeting, President Beal's wishes, that not less than 300 be enrolled during his term of office, will come to pass. He has done *more* than his share towards that end, bringing in 64 new members to date. No telling how many more he has in his pockets to present during the meeting.

The following statement shows a healthy increase in our membership although not as large as all of us would like to see:

Enrolled as per the 1903 Proceedings	1,536	
New members enrolled during the year 1903–1904	218	
Total		1,754
Loss as reported in the 1904 Proceedings:		
By death	19	
By resignation	44	
By suspension	62	
Total loss		125
Remaining on roster of the 1904 Proceedings		1,629
New members elected since Jan. 1, 1905		147
Total		1,776

There ought to be enough new members elected between now and Jan. 1, 1906, to offset the loss by death, resignation and suspension as will be reported in this year's Proceedings, and leave the net membership as above if not more. A continuance of such an increase from year to year will assure the continued prosperity of our Association, and soon relieve the financial strain.

The following statement of disbursements and receipts (please note the reverse order in which these terms are used) will show you how the money is being used by this committee:

DISBURSEMENTS.

For postage and exchange	$22 70
For printed matter, Secretary Whelpley	42 05
For printed matter, Committee	41 08
Express on printed matter	1 85
Badges used at Kansas City meeting	2 50
Commissions	106 00
Total	$216 18

RECEIPTS.

Jan., 1904.	By Secretary Whelpley	$13 50
Sept., 1904.	By self	93 90
Oct., 1904.	By Secretary Whelpley	13 50
Jan., 1905.	By Secretary Whelpley	6 75
Feb., 1905.	By Secretary Whelpley	8 30
Feb., 1905.	By self	35 88
May, 1905.	By self	27 45
Aug., 1905.	By self	13 40
Sept., 1905.	By self	3 50
Total		$216 18

Your Chairman desires to thank each and every member of this committee and all others that in any way contributed to our success—especially our honorable President who met with such phenomenal success in getting new members.

Respectfully submitted, WM. MITTELBACH, *Chairman.*

On motion by C. S. N. Hallberg, seconded by Joseph L. Lemberger, a special vote of thanks was extended to Chairman William Mittelbach for his valuable services on the General Committee of Membership.

On motion, the Council adjourned.

Mr. Main, of New York, moved the adoption of the minutes as read, and that the thanks of the Association be extended to the chairman and members of the Committee on Membership and Reception for the admirable work they had performed during the year.

Mr. Sheppard, of Boston, gave a hearty second to this motion, and said he thought the Association ought to recognize the fact that it had in Mr. Mittelbach, of Booneville, Mo., a most excellent man for the place he occupied. He commended his work as almost marvelous for its thoroughness, zeal and continuity.

The motion to adopt and extend a vote of thanks was then put and carried unanimously.

Mr. Main said he had been struck, upon examining the reports of last year and the year before, with the number of members that had been lost to the Association by resignation or being dropped from the roll for non-payment of dues. He had taken the trouble to look up the standing of a number of those gentlemen in the commercial agencies, and was astonished to find that fourteen members who had resigned, according to the report of 1903, were rated at from $2,500 to $50,000; while of those dropped from the roll for non-payment of dues 33⅓ per cent. had a rating in the commercial agency reports. The same condition was true as to the year 1904. He deplored this state of affairs, and thought that the Committee on Membership, or some special committee, might be effective in keeping members on the roll; they should not be allowed to resign or drop out without a special effort being made to retain them, after all the work of getting them once on the roll. Mr. Main also called attention to the fact that of the members who had resigned quite a number were old members, who for a small sum could have become life-members, and probably would have become such if there had been somebody whose special duty it was to show them how this could be done—and this even though they might have gone out of active business as pharmacists. He was not ready to make a formal motion, but he hoped that something might be done by the Committee on Membership, or through some other channel, to retain these people on the roster of membership.

Mr. Sheppard was impressed by the force of Mr. Main's remarks, and told of the peculiar troubles of the Treasurer in dealing with members who had some fault to find, or who had become delinquent for one cause or

another. The adoption last year of a change in the by-laws on the subject of life-membership had virtually revolutionized the attitude of the Association in that respect. It had hurt the feelings of, and given offense to, a great many old members, since it largely increased the payment required for life-membership, and they thought their rights had been infringed upon. The Association should consider carefully whether the action of last year was wise, as it was his conviction, drawn from correspondence with members during the last year, that under the present order the life-membership list would be closed, absolutely. He welcomed the suggestion of a committee to look after delinquents, for experience had proven that delinquent members paid very little attention to dunning letters.

The Treasurer then made his report as follows:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, JULY 1, 1904, TO JULY 1, 1905.

Cash on hand July 1, 1904			$3,424 66
Received from sale of 11 certificates @ $7.50			82 50
" " 15 certificates @ $5.00			75 00
" " Proceedings			201 85
" " Badges and Bars			102 95
" " National Formulary			214 74
" interest on deposit in New England Trust Co., Boston			94 84
" income from the William Procter Fund			461 91
" re-instatement fees			15 00
" Annual Dues, 1902	$90 00		
" " 1903	255 00		
" " 1904	3,135 00		
" " 1905	2,825 00		
" " 1906	15 00		
		6,320 00	
" from Life Membership Fees:			
Otis W. Smith	$75 00		
Martin I. Wilbert	75 00		
		150 00	
For account Semi-Centennial Index:			
" from the Druggist's Circular	$325 00		
" " Bulletin of Pharmacy	325 00		
" " Merck's Report	325 00		
" " American Druggist	325 00		
		1,300 00	
" " sale of the Semi-Centennial Index		139 68	
" " rebate on insurance premium on Index		2 25	
" " Local Entertainment Committee			
Baltimore, 1898, balance in hand with accrued interest		116 79	
Total			$12,702 17

1904.	DISBURSEMENTS.	
August	19. Check 1081. John S. Bridges & Co., Printing and Stationery	$71 80
	19. Check 1082. William H. Burke, Miscellaneous Expenses	20 00

August	19.	Check 1083. Nixon-Jones Printing Co., Printing and Stationery		$4 00
	19.	Check 1084. H. M. Whelpley, Miscellaneous Expenses		7 70
	19.	Check 1085. E. L. Patch, Miscellaneous Expenses		5 40
	26.	Check 1086. H. C. Kendall, Miscellaneous Expenses		3 00
September	7.	Check 1087. Henry Briele, Badges and Bars		28 00
	7.	Check 1088. Nixon-Jones Printing Co., Printing and Stationery		5 60
	8.	Check 1089. William Mittelbach, Committee on Membership		93 90
November	4.	Check 1090. Charles Caspari, Jr., Semi-Centennial Index		291 10
	9.	Check 1091. J. G. McLean, Stenographer		200 00
	9.	Check 1092. George Reimann, Special Appropriation for Conference of Boards of Pharmacy		30 15
	9.	Check 1093. Wilbur L. Scoville, Miscellaneous Expenses		1 30
	9.	Check 1094. C. H. Buck & Co., Printing and Stationery		48 50
	9.	Check 1095. Mercantile Printing Co., Section on Scientific Papers		14 50
	9.	Check 1096. John S. Bridges & Co., Printing and Stationery		6 35
	9.	Check 1097. Nixon-Jones Printing Co.—		
		Printing and Stationery	$27 55	
		Committee on Membership	13 50	
				41 05
	9.	Check 1098. Harry B. Mason. Section on Education and Legislation		7 57
	9.	Check 1099. S. A. D. Sheppard, Traveling Expenses		93 50
	9.	Check 1100. C. Lewis Diehl, National Formulary		22 00
	9.	Check 1101. Alpha-Photo Engraving Co., Proceedings		42 00
	9.	Check 1102. Charles Caspari, Jr.—		
		Proceedings	$6 98	
		National Formulary	83	
		Traveling Expenses	53 30	
		Miscellaneous Expenses	51 14	
		Badges and Bars	1 50	
				113 75
	9.	Check 1103. Wickersham Printing Co.—		
		Proceedings	$30 56	
		National Formulary	1 79	
		Insurance	6 88	
		Printing and Stationery	44 10	
				83 33
	12.	Check 1104. C. Lewis Diehl, 1st half-year's salary as Reporter on Progress of Pharmacy, 1904–1905		375 00
	12.	Check 1105. S. A. D. Sheppard, 1st half-year's salary as Treasurer, 1904–1905		375 00
	12.	Check 1106. H. M. Whelpley, 1st half-year's salary as Secretary of Council and Secretary of Committee on Membership, 1904–1905		150 00
	12.	Check 1107. Charles Caspari, Jr., 1st half-year's salary as General Secretary, 1904–1905		500 00
	27.	Check 1108. George M. Beringer, Enno Sander Prize		50 00

November	27.	Check 1109. H. M. Whelpley, Miscellaneous Expenses...		$13 10
	27.	Check 1110. Nixon-Jones Printing Co.—		
		Printing and Stationery.....	$13 90	
		Committee on Membership.....	6 75	
				20 65
1905.				
January	20.	Check 1111. Alpha Photo-Engraving Co., Proceedings ...		5 60
	20.	Check 1112. Wickersham Printing Co.—		
		National Formulary	$13 55	
		Proceedings.....	22 43	
				98
	20.	Check 1113. John S. Bridges & Co.—		
		Section on Education and Legislation.....	$4 52	
		Section on Scientific Papers	3 77	
		Section on Commercial Interests	4 00	
		Section on Practical Pharmacy.....	3 76	
		Section on Historical Pharmacy.....	4 02	
				20 07
	20.	Check 1114. James H. Beal, Miscellaneous Expenses		11 89
February	15.	Check 1115. Nixon-Jones Printing Co.—		
		Committee on Membership.....	$8 30	
		Printing and Stationery.....	3 85	
				12 15
	15.	Check 1116. John S. Bridges & Co., Proceedings		4 50
	15.	Check 1117. William Mittelbach, Committee on Membership.....		35 88
March	25.	Check 1118. S. A. D. Sheppard & Co.—		
		Certificates.....	$0 75	
		Printing and Stationery.....	11 03	
		Miscellaneous Expenses	14 66	
				26 44
	25.	Check 1119. Nixon-Jones Printing Co., Printing and Stationery		1 75
	25.	Check 1120. John S. Bridges & Co., Printing and Stationery		11 75
	25.	Check 1121. Charles Caspari, Jr.—		
		Proceedings.....	$12 36	
		National Formulary.....	2 66	
		Miscellaneous Expenses.....	15 22	
		Journals	30 39	
		Premium on Treasurer's Bond	12 50	
				73 13
April	25.	Check 1122. John S. Bridges & Co., Section on Historical Pharmacy.....		3 52
	25.	Check 1123. Daniel Base, Semi-Centennial Index		119 00
	25.	Check 1124. Moore & Co., Semi-Centennial Index.....		18 50
	25.	Check 1125. Fleet-McGinley Co., Semi-Centennial Index.		1,144 60
	25.	Check 1126. Wickersham Printing Co., Proceedings		2,033 92
May	5.	Check 1127. William Mittelbach, Committee on Membership		27 45
	5.	Check 1128. Wickersham Printing Co.—		
		National Formulary	$28 25	

		Proceedings	$5 46	
		Miscellaneous Expenses	60	
				$34 31
May	23.	Check 1129. Nixon-Jones Printing Co., Printing and Stationery		12 40
	23.	Check 1130. I. H. Lipsky, Engrossing Certificates		4 75
	23.	Check 1131. U. Holzer, Miscellaneous Expenses		2 55
	23.	Check 1132. C. H. Buck & Co., Printing and Stationery		59 50
June	7.	Check 1133. Wickersham Printing Co., Proceedings		657 08
	9.	Check 1134. American Bank Note Co., Certificates		210 00
	9.	Check 1135. Wickersham Printing Co., Proceedings		12 19
	9.	Check 1136. John S. Bridges & Co., Printing and Stationery		13 00
	19.	Check 1137. James H. Beal, Miscellaneous Expenses		16 98
	19.	Check 1138. H. M. Whelpley, Miscellaneous Expenses		6 85
	19.	Check 1139. C. H. Buck & Co., Printing and Stationery		3 00
	19.	Check 1140. H. M. Whelpley, 2nd half-year's salary as Secretary of Council and Com. on Membership, 1904–1905, less 10 per cent. of the appropriation		120 00
	19.	Check 1141. C. Lewis Diehl, 2nd half-year's salary as Reporter on Progress of Pharmacy, 1904–1905, less 10 per cent. of the appropriation		300 00
	19.	Check 1142. S. A. D. Sheppard, 2nd half-year's salary as Treasurer, 1904–1905, less 10 per cent. of the appropriation		300 00
	19.	Check 1143. Charles Caspari, Jr., 2nd half-year's salary as General Secretary, 1904–1905, less 10 per cent. of the appropriation		400 00
				$8,456 99
1904.				
September	7.	Life Membership Fund, Otis W. Smith	$75 00	
	7.	Life Membership Fund, Martin I. Wilbert	75 00	
				150 00
				$8,606 99

SUMMARY OF DISBURSEMENTS, JULY 1, 1904, TO JULY 1, 1905.

Proceedings	$2,833 08
Stenographer	200 00
Journals for the Reporter on Progress of Pharmacy	30 39
Salaries	2520 00
Premium on Treasurer's Bond	12 50
Traveling Expenses	146 80
Section on Practical Pharmacy and Dispensing	3 76
Section on Education and Legislation	12 09
Section on Commercial Interests	4 00
Section on Scientific Papers	18 27
Section on Historical Pharmacy	7 54
Committee on Membership	185 78
Printing and Stationery	338 08
Insurance	6 88
Badges and Bars	29 50
Certificates	215 50
Enno Sander Prize	50 00

Special appropriation for conference of Boards of Pharmacy	$30 15
Miscellaneous expenses	170 39
Life Membership Fund	150 00
National Formulary	69 08
Semi-Centennial Index	1573 20
Total amount of disbursements	$8606 99
Cash on hand, July 1, 1905	4095 18
Total	$12,702 17

APPROPRIATIONS AND EXPENDITURES UNDER THE SAME FOR THE FISCAL YEAR, JULY 1, 1904, TO JULY 1, 1905.

	Appropriations.	Expenditures.
Salaries	$2,520 00	$2,520 00
Proceedings	2,850 00	2,833 08
Printing and Stationery	338 08	338 08
Miscellaneous Expenses	175 00	170 39
Stenographer	200 00	200 00
Badges and Bars	100 00	29 50
Journals for Reporter on Progress of Pharmacy	50 00	30 39
Section on Scientific Papers	25 00	18 27
Section on Education and Legislation	20 00	12 09
Section on Commercial Interests	20 00	4 00
Section on Practical Pharmacy and Dispensing	20 00	3 76
Section on Historical Pharmacy	20 00	7 54
Premium on Treasurer's Bond	12 50	12 50
Insurance	20 00	6 88
Traveling Expenses	146 80	146 80
Conference of Boards of Pharmacy	30 15	30 15
General Committee on Membership	230 00	185 78
Certificates	225 00	215 50
Unexpended balance		237 82
	$7,002 53	$7,002 53

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll at the annual meeting, and also from members whose residence is unknown, there was outstanding on the books of the Association July 1, 1905:

Annual Dues for 1904	$935 00
Annual Dues for 1905	4,175 00
	$5,110 00

Respectfully submitted,

S. A. D. SHEPPARD, *Treasurer.*

YORK, PENNSYLVANIA,
July 15th, 1905.

We have examined the books of the Treasurer of the American Pharmaceutical Association and on comparing the records with the vouchers find them correct, and all the funds of the Association properly accounted for. The cash balance on June 30th, 1905, amounting to $4,095.18 corresponding with the bank book.

GEORGE A. GORGAS,
GUY S. BOYD,
JOHN F. PATTEN,
Chairman.

ADDENDUM TO TREASURER'S REPORT.

July 1, 1905.

All Association bills, due July 1, 1905, have been paid, except a few small ones not presented, amounting to $53.44.

The net cash balance, July 1, 1905, is $1,064.86.

The receipts for the year, using the income of the Procter Fund, $461.91, exceeded the expenses by $670.52.

Early in April of this year it seemed to be a certainty that there would be a deficit, but our general receipts during the latter part of the fiscal year were larger than we anticipated; also, in addition to these increased general receipts, there was paid in by the Committee of Arrangements for the Baltimore meeting of 1898 the sum of $116.79.

Again, we expected there would be a large bill to pay for the publication of the first edition of the newly revised National Formulary, also the cost of its preparation by Prof. Diehl; but this expense did not come into the fiscal year just closed. It will, however, have to be provided for in the year 1905–1906.

Four of the five pharmaceutical journals, that contracted to bear the cost of the preparation and publication of the semi-centennial index, have paid in their share of the estimated expense.

The Procter Fund has increased $150.00, being the amount received for life membership fees during the year. The income of this fund has been used for current expenses.

The Centennial Fund has increased $69.01, being the amount of its income.

The Ebert Fund has increased $35.76, being the amount of its income.

The total increase of all the funds, for the fiscal year, July 1, 1904 to July 1, 1905, is $254.77.

Respectfully submitted,
S. A. D. SHEPPARD,
Treasurer Amer. Pharm. Assoc.

On motion of Mr. C. G. Merrell, of Cincinnati, the report of the Treasurer was ordered received and filed.

The report of the Secretary was called for by the chair as being next in order, but before reading his report the Secretary directed attention to the fact that the Association was still indebted to the pharmaceutical journals for the fund loaned for the publication of the Semi-Centennial Index to the Proceedings, and that it was highly desirable to reduce this indebtedness, and to that end he had brought with him fifty copies of the Index, which he proposed to dispose of at this meeting at five dollars each, and to take away with him orders for one hundred more, which would mean a fund of $750 all told. At the suggestion of Mr. Ebert, of Chicago, who proved the faith that was in him by subscribing for a copy of the Index at once, the Secretary proceeded forthwith, while the iron was hot, to take subscriptions for the Index, and almost every one present agreed to take a copy. Some forty-five subscriptions were taken in this way.

The Secretary then read his report as follows:

REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM JULY 1, 1904, TO JUNE 30, 1905.

I. Receipts.

From Sales and Payment of Bills due July 1, 1904		$214 74

II. Expenditures.

Typewriting, Postage, etc. (Expenses of Committee)	$22 00	
Paper and Press-Work, 150 copies National Formulary	17 50	
Binding 150 copies National Formulary in cloth, @ 11 cts.	16 50	
Binding 500 copies Physicians' Epitome, N. F., @ 4¼ cts.	22 50	
Imprinting cover on Physicians' Epitome	3 00	
Expressage and Postage (National Formulary)	25 13	
Expressage and Postage (Physicians' Epitome)	75	
		107 38

III. Remittances.

To Treasurer, as per Treasurer's Receipts	214 74

IV. Sales.

To dealers and individuals, as per ledger accounts:		
National Formulary	$135 64	
Physicians' Epitome	56 90	
		192 54

V. Accounts Unpaid.

By dealers	0

VI. Bills Due by the Association.

For Press-Work, Binding, etc.; Bills not presented before July 1, 1905	23 64

VII. Stock on Hand.

Copies in flat sheets (unbound)	100	
Copies bound in cloth	50	
Copies bound in cloth, interleaved	0	
Copies bound in sheep	0	
Copies bound in sheep, interleaved	0	
		150

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1904 (see Proc., Vol. 52, p. 36)	$13,142 58	
Receipts from July 1, 1904, to June 30, 1905	214 74	
		$13,357 32
Expenses to June 30, 1904 (see Proc., Vol. 52, p. 36)	$7,702 42	
Expenses from July 1, 1904, to June 30, 1905	107 38	
		$7,809 80
Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1905		558 42
Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1905		649 45

C. SALE OF PROCEEDINGS.

Receipts from July 1, 1904, to June 30, 1905	201 85
Remitted to Treasurer, as per Treasurer's Receipts	201 85

D. SALE OF GENERAL INDEX OF PROCEEDINGS.

Receipts from July 1, 1904, to June 30, 1905	139 68
Remitted to Treasurer, as per Treasurer's Receipts	139 68

E. ACCOUNT OF BADGES AND BARS.

On hand July 1, 1904 (see Proc., Vol. 52, p. 37)	Badges 28, Bars 88	
Received August 30, 1904, from Henry Briele, Mfr.....	" 0, " 40	
	28 128	
Badges sold from July 1, 1904, to June 30, 1905, 28 @ $2.00.....	$56 00	
Bars sold from July 1, 1904, to June 30, 1905, 57 @ 75 cts.....	42 75	
2 @ 60 cts.....	1 20	
2 @ 50 cts.....	1 00	
		100 95
Remitted to Treasurer, as per Treasurer's Receipts		100 95
Balance on hand July 1, 1905	Badges 0. Bars 67	
Receipts from Sale of Badges and Bars to June 30, 1904 (see Proc., Vol. 52, p. 37).....	$1090 55	
Receipts from July 1, 1904, to June 30, 1905.....	100 95	
		1,191 50
Total Cost of Badges and Bars to June 30, 1904 (see Proc., Vol. 52, p. 37)	$1,065 35	
Cost of 40 Bars received August 30, 1904.....	28 00	
		$1,093 35

CHAS. CASPARI, JR., *General Secretary.*

Baltimore, July 1, 1905.

On motion of Mr. Brundage, of New York, the report was ordered received and filed.

The report of the Committee on National Formulary was presented by Chairman C. Lewis Diehl, as follows:

REPORT OF COMMITTEE ON THE NATIONAL FORMULARY.

In compliance with the request of the Council, and the authority conveyed to me as Chairman of the Committee on National Formulary, I have endeavored to formulate the text for a second revised edition of the National Formulary in conformity with the instructions voted at different times by the Association, and herewith submit the same with the hope that it may deserve the approval of the members. While, however, this task was allotted to me personally—for which reason I use the personal pronoun in this report—I have preferred not to rely exclusively on my own judgment in the final preparation of this work, but have from time to time consulted with other members of the Committee, and particularly with the chairmen of the sub-committees, Messrs. Hallberg, Hynson and Scoville, who promptly responded when appealed to and to whom I feel indebted for their untiring patience and courteous assistance.

The completion of this revision, following closely on the appearance of the United States Pharmacopœia of 1900, should be gratifying to the Association as it is to the members of this Committee, particularly when it is considered that much of the work of

revision could not be completed until the revised edition of the Pharmacopœia was available, and that the task of converting metric weights and measures, so that these could be given as an alternative in the Apothecaries' system, was both exacting and arduous. This particular feature and the introduction of doses, are the two most conspicuous innovations which, it is believed, will very materially add to the utility and, it is hoped, popularity of the Formulary. Another innovation consists in the separation of the formulas for obsolete U. S. P. preparations from the main text of the Formulary and collecting them in an "Appendix" to it, including the formulas which have been dismissed from the Pharmacopœia of 1900—the original text of these formulas being restored or maintained; but, as in the main text, the alternative values are also given in Apothecaries' terms, so as to render the work uniform throughout in this respect. In accordance with the expressed desire, an attempt was made to devise short synonyms or abbreviated titles for some of the lengthy ones now in use; but this virtually remained an attempt, having been found practicable only in a few instances. Short titles have, however, been given to the new formulas wherever this was feasible.

The number of formulas added to the Formulary is 49, and these, with one or two exceptions, have been sufficiently described in previous reports; while 15 formulas having been admitted into the Pharmacopœia, have been dismissed. Two other formulas (Carbassus Carbolata and Carbassus Iodoformata) have also been omitted from the Formulary on the ground of inefficiency for the intended purpose, leaving an actual increase of 32 formulas. A further reduction of formulas, properly designated as "N. F.," is occasioned by the relegation of 30 obsolete U. S. P. formulas, heretofore given in the general text, into the "Appendix," but here they appear, together with 84 formulas, dismissed from the U. S. P., 1900, and consequently just as available for reference in the National Formulary as they have been heretofore, though no longer designated as N. F. preparations.

In accordance with the recommendations of the sub-committee on Correction of formulas, about 65 or 70 formulas have been corrected so as to eliminate certain imperfections, usually of a trifling nature, that have been complained of. In consequence, it is confidently believed that the formulas as now given in the Formulary are in unobjectionable shape. Among these corrected formulas is Tinctura Antiperiodica, or "Warburg's Tincture." This is particularly mentioned for two reasons: the one that I have ventured to make the correction in conflict with the previous decision of the committee; the other, because it serves to point out a lesson which, being apropos to the objects of the Formulary, I shall take the liberty to point out here. To do so properly it becomes necessary to revert to some historical facts which may not be uninteresting.

Some time during the latter years of the seventies or the first of the eighties I received, as I remember, a printed slip evidently intended for widespread circulation, giving a brief account of Warburg's Tincture, together with, as I have every reason to believe, the authentic formula of Dr. Warburg for preparing this tincture, which had proven an almost miraculous remedy for certain forms of fever in India, and for this reason had been acquired by purchase and published by the British authorities in East India. This slip was received either directly from Dr. Rice, who was then Associate Editor of "New Remedies," or was directed to me from the office of that journal, it having, however, always been my impression that it was received from Dr. Rice. Be this as it may, I immediately prepared some of the tincture, carefully and explicitly following the original formula in every detail, even to preparing a powder of various aromatics and drugs given as the components of the obsolete "Confectio Demokratis" required as one of the ingredients, and with equal care and fidelity recorded the formula and manipulation necessary for the preparation of the tincture and this powder in my laboratory memorandum book. This formula was followed by me in making "Warburg's Tincture" from that time to the time when I disposed of my business, and I have reason to believe that it is so made by my successors. When in 1886, at Providence, the Committee on

National Formulary made their preliminary report, on the basis of which the text of the Formulary was reported in 1888, at Detroit, I noted that the formula for "Tinctura Antiperiodica, Warburg," was identical with that which had been communicated by the before-mentioned slip, with these exceptions: the Confectio Demokratis was replaced by powdered opium (its important constituent) in the quantity of 2 grains to the pint, and a stock-tincture was directed to be made *without aloes*, from which the regular tincture was to be prepared by the addition of aqueous extract of aloes. I did not notice, however, at the time, that there was an error in the amount of extract of aloes prescribed, which was 28 grains and should have been, and doubtless was intended to be, 128 grains. Dr. Rice having declined to reassume the duties of Chairman of the Committee after reporting the text of the completed Formulary in 1888, this office was assigned to me; but not having occasion to consult the National Formulary for a formula for Warburg's Tincture, for reasons already stated, I did not become aware of the discrepancies that have since been noted by Sieker, Martindale, and others (see Proceedings, 1901, 607–609), until it devolved upon the Committee to revise the Formulary, during 1891–1895, when I also became aware of these discrepancies, namely: the omission of the Confectio Demokratis (or of its proposed equivalent, opium) and of the chalk; the reduction of the quantities of ingredients about 10 per cent., and the direction to use diluted alcohol U. S. P. instead of alcohol and water as an equivalent of the stronger proof spirit (Spiritus Tenuior) of the B. P. In the belief that these changes had been made advisedly, and in deference to the better judgment of Dr. Rice, I failed to recommend any change, although I am now by no means certain that Dr. Rice was responsible for the deviation from the formula given in the preliminary report of 1886. Since the formula has now however been criticized, I realize that the correction should have been made at the first revision, and this has been effected for the present one, constructing the formula on the lines of the original formula, which comports with the one forming the basis for Mr. Martindale's criticism, and also with the formula reproduced as Dr. Warburg's original formula on page 1828 of the U. S. Dispensatory, 18th Ed., 1899.

In conformity with the other formulas of the N. F., the proportions have been adjusted to make 1000 Cc. (or 32 fluidounces) of Tincture, and thus convenient for increase or reduction of quantities by multiplication or division. Opium has been added in the proportion originally suggested (2 grains to the pint), together with some black pepper, cinnamon and ginger, as suggested by Mr. Martindale, who considers it highly probable that "Confectio Demokratis," employed by Dr. Warburg for his preparation was the Confection of Opium at the time official in the B. P. In place of diluted alcohol, a mixture of 3 volumes alcohol and 2 volumes of water is directed, as recommended by Mr. Sieker, such a mixture fairly corresponding to Spiritus Tenuior (Proof Spirit), formerly official in the B. P. The lesson taught is, that we cannot too closely follow the text and intent of a prescription, a matter sufficiently important in all cases if we aim to establish and preserve authoritative formulas, but of particular importance in the case under discussion, because of the very extraordinary therapeutic properties and effects that were claimed for what is, in point of fact, simply a solution of quinine sulphate in that ancient nostrum, still popular among the masses on the continent of Europe, known in the vernacular as Swedish Bitters, Jena Drops, Werner's Elixir of Life, Augsburg Essence of Life, and by the Latin title of Elixir ad Longam Vitam, Elixir Polychrestum Lenticulus, Elixir Antipestilentiale, Elixir Spina, Tinctura Sacra, and, in the older pharmacopœias, as Tinctura Aloe Composita.

In conclusion, I may mention that at my request the General Secretary has provided some sample pages exhibiting the arrangement adopted for the formulas, as well as the typography of the proposed text, to which the attention of the Association is invited for possible criticism or change.

Respectfully submitted,

C. Lewis Diehl,
Chairman Com. on National Formulary.

On motion of Mr. Hallberg the report was ordered received and referred to the Section on Practical Pharmacy and Dispensing.

The Committee on President's Address was called on for a report, and Mr. W. C. Anderson, of Brooklyn, took the chair while Mr. Kremers, chairman of the committee, presented the following:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

For a number of years the membership of this Association has been on the decline, but the loss of members seemed to make but little impression. It is, therefore, as fortunate as it may seem strange, that this Association is fully roused to the necessity of a more permanent and better membership at a time when the roll of members may reveal the largest number in the history of our Association.

It would be unjust to the rank and file of active members of this Association to attribute this numerical success to any one man or group of men. While the Association owes much to the chairman of the Committee on Membership, it is not without significance that the maximum in membership should be attained under the leadership of our present executive, whose able address fully meets our highest expectations. More than one member of this Association knows full well how persistent have been his efforts to increase the quality of our membership as well as its numbers. The Association may well congratulate itself not only because of the success thus far attained, but still more because of the wise provisions suggested in the President's Address further to strengthen this Association in the future.

1. One of the most conspicuous defects of our organization lies in the fact that this Association does not come into direct touch with the large majority of members oftener than once a year. The recommendation of our President that a "convenient and frequently issued medium" be sent to our members in order that they may "realize that they belong to a live and active organization," meets with the hearty approval of your committee. We would recommend, therefore, that the General Secretary be instructed to effect a separation of the proceedings proper to be published in an annual volume as heretofore, and to issue as a monthly bulletin such matters as the President has indicated in his address, the Committee on Publication to coöperate with the General Secretary as heretofore.

2. Your committee is further of the opinion that interest in the Association will be stimulated by giving all members an opportunity to participate in the election of the general officers. Your committee would recommend, therefore, that the President's plan be given an unofficial trial, the result to be reported at the next annual meeting, when such report may be made the basis for more permanent action by the Association.

3. If the American Pharmaceutical Association is to be truly a continental association, in accordance with its name, the establishment of sections, which have proven so essential to the life of national associations, should be begun at the earliest possible moment. Your committee, therefore, suggests that the recommendation of our President pertaining to the establishment of a Canadian section be approved, and that the General Secretary and those members who are residents of Canada be appointed a committee to effect provisional organization of a Canadian Section if thought desirable by our Canadian colleagues.

4. Your committee further approves of the recommendation made by the President with reference to the National Formulary, viz.: "that the Council be instructed to invite propositions from responsible publishing houses" for the publication of the National Formulary "upon such terms as will insure the most extensive circulation, together with the greatest financial return to the Association, at the same time preserving to the Association the full and untrammeled ownership of the copyright."

5. The last recommendation of the President pertaining to the general welfare of this Association also seems worthy of at least a trial. Your committee would recommend, therefore, that the incoming President be instructed to appoint the following supplementary committees on membership, viz.:

a. On faculties and students;

b. On boards of pharmacy;

c. On State and local associations;

d. On members who have been suspended or whose membership has lapsed.

6. Finally, the President's recommendation pertaining to the use of preservatives should receive our careful consideration.

Inasmuch as this subject is to be discussed by the chairman of the Scientific Section, your committee would recommend that it be referred to the Scientific Section, with the request that a report be made to the Association at large before adjournment of this meeting.

HENRY KRAEMER,
EDWARD KREMERS.

Mr. Mayo, of New York, moved that the report be received and that the recommendations made be taken up *seriatim* for consideration and action. This motion was seconded by Mr. F. E. Stewart, of New Jersey, and carried.

Chairman Kremers read the first recommendation, that relating to the establishment of a monthly bulletin by the Association. Mr. Whelpley, of St. Louis, seconded by Mr. John F. Hancock, of Baltimore, moved the adoption of the recommendation as read.

After considerable discussion of the recommendation, which was participated in by Messrs. Main, Kremers, Caspari, Ebert, Cohn, Hays, Whelpley and Hynson, the Chair put the vote on the motion to adopt the recommendation as made by the committee, and it carried with applause.

Chairman Kremers read the second recommendation, that all members be given an opportunity to participate in the election of general officers. On motion of Mr. Eliel the recommendation was adopted as read.

The third recommendation, advising the establishment of a Canadian Section of the American Pharmaceutical Association, was adopted without dissent.

The fourth recommendation, as to publication of the National Formulary, was read by Chairman Kremers, and Mr. Hancock, of Baltimore, seconded by Mr. Ebert, moved to adopt as read.

Mr. Geo. M. Beringer called attention to the fact that the language of the recommendation was "that the Council be instructed to invite propositions," and wanted to know if that gave them power to act. Mr. Kremers replied that that was the intention.

Mr. Eliel wanted to know if the Publication Committee did not have power now to proceed with a matter of this kind. The Chair and Mr. Kremers stated that that was the intention of the recommendation. Secretary Caspari stated that last year the Publication Committee was instructed to proceed with the publication of the revised edition of the

National Formulary, and that action of the Council was approved by the Association in general session. So they had authority to go ahead now and publish, and this recommendation was simply to invite proposals.

The motion to approve the recommendation was then put and carried.

Mr. Kremers read the fifth recommendation, that supplementary committees on membership be appointed by the President. Mr. Hancock, seconded by Mr. Ebert, moved to adopt, and the motion was put and carried.

Mr. Kremers then read the sixth and last recommendation, as to the use of preservatives, which recommendation, on motion of Mr. Ebert, seconded by Mr. Eliel, was adopted as read.

Mr. Whelpley then moved to adopt the report as a whole, which motion was seconded by Mr. Hynson and carried.

President Beal resumed the chair.

In the absence of Chairman Lyons, of the Committee on U. S. Pharmacopœia, who, Mr. Hallberg, of the committee, explained, had been detained at home by illness in his family, the report of that committee was presented by Mr. Hallberg, with the suggestion that the chairman of the committee had marked certain paragraphs that it might be profitable to read, but he would like simply to give a summary of the contents of the paper, and then it could be referred to the Section on Scientific Papers. Mr. Ebert moved that the report be referred at once to the Section on Scientific Papers without being read or abstracted, and the motion was seconded by Mr. Wilbert, of Philadelphia, and carried.

Chairman Ebert presented the report of the Committee on National Legislation, which was applauded during the reading and heartily applauded at its close.

REPORT OF THE COMMITTEE ON NATIONAL LEGISLATION.

To the Officers and Members of the American Pharmaceutical Association:

Your special Committee on National Legislation respectfully reports that nothing of importance has required our attention during the past year.

We submit to you a few suggestions relative to the creation of a committee empowered to take into consideration the whole subject of legislation, both state and national.

The growth of the drug habit and the multiplication of its victims show no signs of abatement, and there is an increasing demand in many states for legislation intended to lessen, and, if possible, to destroy this evil. But the difficulty of securing legislation which will accomplish the results desired without producing other results, which reasonable men do not desire, is very great. It is eminently fitting that the American Pharmaceutical Association should lead in this great work, and it has already done so to the extent of formulating a model anti-narcotic law, which has been received with approval in many quarters. Certain features of it have already found their way into the statutes of two or three states, but in some instances they have been rendered to some extent ineffective by the addition of clauses not in harmony with the general purpose and spirit of the act.

No more important subject affecting the public health is now before the public than this question of legislation to check the indiscriminate sale of narcotic drugs, and no

legislation requires in its preparation more careful consideration and study. Yet in most of the states legislative sessions are very short, frequently less than two months in duration. Not one member in a hundred has any familiarity with the subject, and few of them have either time or inclination to give it any careful study. It is exceedingly unfortunate that there are not more men sent to every Legislature who have a thorough knowledge of both the practical and scientific sides of the drug business. If a few well-equipped men of this character were members of each state Legislature, many unwise and impracticable enactments would be kept off the statute books, and some effective and useful legislation might in time be hoped for.

While it is comparatively easy to theorize upon the subject and even to draft legislation which would be ideally desirable under ideal conditions, we must remember that all legislators are men, and that most of them are politicians; and that they are frequently confronted with conditions, limitations and demands which they are unable or unwilling to ignore; and, the result is, in many cases (so far as drug legislation is concerned), a piece of botch-work, generally ineffective and sometimes bordering on the grotesque.

Substantially uniform legislation regulating the sale of poisons and narcotics in all the states is greatly to be desired. Wide divergence between the laws of different states, and especially those of adjoining states upon any subject of this importance, is liable to result in the nullification of one or the other. In suggesting the outlines of a model law, we have already indicated our purpose to take the lead in this matter; but the results of the action already taken may fall far short of our hopes, unless supplemented by persistent work along practical lines.

In this connection we note, as a fact of considerable practical importance, that the Proprietary Association has given strong indications of a desire to see enacted in the various States comprehensive and effective laws to regulate the sale of dangerous drugs. Whatever we may think of the ethics of proprietary medicines, we cannot overlook their existence, and we must, therefore, view with satisfaction the stand taken by the large manufacturers upon this subject, and their outspoken advocacy of stringent legislation to regulate and restrict the sale of narcotic drugs.

Never was there greater need for members of our profession to assert themselves, and to claim the right to a controlling voice in legislation which vitally affects them. Already in some parts of the country the agricultural interests, represented by dairy and food commissioners, have secured an extension of their jurisdiction over the pharmacists of the State. This is a most humiliating condition of affairs, but it is one which is likely to be indefinitely extended unless there is earnest, active and united resistance on the part of the drug trade. And we should not rest satisfied with negative action only. There must be *affirmative* action as well, and whenever a law is to be made affecting pharmacists and druggists, it should be drafted by pharmacists and not by agriculturalists, and after it is made it should be *administered* by pharmacists and not by agriculturalists.

This tendency of agriculturalists to extend their jurisdiction at our expense crops out in connection with the so-called Pure Food bills, which are generally framed up and pushed through largely by the agricultural interests. This would be all right if they would let drugs alone. But when the farmers insist on legislating upon both subjects at the same time and in the same bill, the pharmacists should either draft the drug features of the bill, or they should insist upon separating the subject of drugs and medicines from that of butter and cheese, and should also insist that jurisdiction over the subject of drugs and medicines shall be given only to men who are possessed of both scientific and practical knowledge of the drug business. Unless the members of our profession insist upon their rights in this matter, it will not be many years before pharmacists will be required to take orders from and bow subserviently to political farmers and political chemists in all parts of the country.

The jurisdiction of your Committee on Legislation extends only to matters of legisla-

lation pending in Congress. We believe that the public welfare and the interest of the profession of pharmacy demand the creation by this Association of a committee empowered to take into consideration the whole subject of legislation, both State and national, having for its primary object the encouragement of wise, just and (so far as practicable) uniform laws governing the sale of drugs, medicines and poisons, and specially authorized to appoint committeemen in each State and territory who will keep the general committee informed as to the situation in their respective localities, thus bringing the Association in closer touch with legislation throughout the entire country, and enabling us more effectively to promote the interests of our profession and to serve the public by encouraging the enactment of just, reasonable and wholesome laws.

We believe that the growing demand for legislation affecting the sale of narcotics, the present situation of the drug trade, and the danger of bad legislation which confronts it, will fully justify either the extension of the jurisdiction of your present Committee, or the creation of a new committee having the requisite jurisdiction, and authorized to confer and act with like committees of any and all other drug organizations whenever the welfare of the public and the interests of the drug trade can be best promoted by such co-operation.

Respectfully submitted,

FRANK C. HENRY, *Chairman.*
ALBERT E. EBERT,
HENRY CANNING.

Mr. Mayo, of New York, moved to adopt as read, and the motion was seconded by Mr. Cohn.

Mr. F. E. Stewart said that, as former chairman of the committee, he hoped the Association would take this matter under earnest consideration. He said the report just made could only be appreciated by those who had done this work.

Mr. Eliel thought the report brought up a number of very important points that should be very carefully considered. The statements of the committee in regard to State legislation, and the necessary steps to protect from harmful legislation, showed the necessity of the pharmacist mixing in politics to a limited extent. He gave the result of his own experience in some attempted legislation in his own State (Indiana) a few years ago, and said he was instrumental in having passed a State laboratory bill by authority of which drugs and foods would be examined under the auspices, not of a dairy commission or agricultural commission, but by the State Board of Health, where it would be well done. The same influence enabled him to very materially aid in the defeat of a poison bill which would have worked great hardship on the drug trade of the State.

The motion to receive the report of the committee and spread upon the minutes was then carried.

Thereupon, Mr. Mayo, of New York, moved the following:

"*Resolved*, That the Council be instructed to prepare and submit an amendment to the By-laws providing for a change in the name of the committee from the present name of the Committee on National Legislation to some other suitable name, and to enlarge the scope and duty of the committee so as to empower the committee to co-operate with pharmacists in legislative matters at any time, affecting pharmacists anywhere, and to provide a committee along the lines proposed in the report of the Committee on National Legislation."

Mr. Payne, of Georgia, seconded the motion, and took occasion to congratulate Mr. Ebert on his excellent report. He had just recently gone through with the same sort of experience in Georgia, where a bill providing for drug inspection placed the power of inspection in the hands of agriculturists, not pharmacists, and he succeeded in getting the provision in regard to the inspection of drugs stricken out. It was much easier to kill an objectionable feature in a bill before it became a law, when the author of the bill was trying to get supporters for it, than to get the trouble remedied after the bill had become a law.

Mr. Mayo's resolution was then adopted.

Treasurer Sheppard offered the following amendment to the By-laws, which, under the rule, would have to lie over until the next session:

"That the By-laws be amended by dropping section 5, article xiii, chapter viii. Also change the numbers of sections 6, 7, 8 and 9 of article xiii, chapter viii, to numbers 5, 6, 7 and 8."

Mr. Sheppard explained that this was a mere clerical correction that was overlooked two years ago, when a change was made in the system of electing members by vote of Council.

Mr. Hallberg, in the absence of Chairman Kauffman, presented the report of the Delegates to the Section on Pharmacology of the American Medical Association. On motion of Mr. Wilbert, of Philadelphia, the report was received and ordered referred to a special committee of three, to be appointed by the Chair, to consider the feasibility and practicability of this Association's taking part or acting in the work that is being done by the American Medical Association, this committee to report at the last general session and the report acted on then. The Chair appointed on said committee Messrs. Wilbert, of Philadelphia; Beringer, of Camden, N. J., and Kauffman, of Columbus, O.

On motion of Mr. Wilbert, the Association then adjourned.

THIRD SESSION—TUESDAY EVENING, SEPTEMBER 5, 1905.

No business was transacted by the Association previous to the session of the Section on Historical Pharmacy.

FOURTH SESSION—WEDNESDAY MORNING, SEPTEMBER 6, 1905.

No business was transacted previous to the first session of the Section on Pharmaceutical Education and Legislation.

FIFTH SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 6, 1905.

No business was transacted previous to the second session of the Section on Pharmaceutical Education and Legislation.

SIXTH SESSION—WEDNESDAY EVENING, SEPTEMBER 6, 1905.

No business was transacted previous to the first session of the Section on Scientific Papers.

SEVENTH SESSION—THURSDAY MORNING, SEPTEMBER 7, 1905.

No business was transacted previous to the second session of the Section on Scientific Papers.

EIGHTH SESSION—THURSDAY AFTERNOON, SEPTEMBER 7, 1905.

No business was transacted previous to the session of the Section on Commercial Interests.

NINTH SESSION—THURSDAY EVENING, SEPTEMBER 7, 1905.

No business was transacted previous to the first session of the Section on Practical Pharmacy and Dispensing.

TENTH SESSION—FRIDAY MORNING, SEPTEMBER 8, 1905.

No business was transacted previous to the second session of the Section on Practical Pharmacy and Dispensing.

ELEVENTH SESSION—FRIDAY AFTERNOON, SEPTEMBER 8, 1905.

The Association was called to order by President Beal at 3:20 p. m., according to program, for the installation of officers.

The Secretary read the list of newly-elected officers as follows:

President—Joseph L. Lemberger, of Pennsylvania.
First Vice-President—Chas. Holzhauer, of New Jersey.
Second Vice-President—Chas. A. Rapelye, of Connecticut.
Third Vice-President—Fabius C. Godbold, of Louisiana.
Treasurer—Samuel A. D. Sheppard, of Massachusetts.
General Secretary—Chas. Caspari, Jr., of Maryland.
Reporter on the Progress of Pharmacy—C. Lewis Diehl, of Kentucky.
Members of the Council—James H. Beal, of Ohio; Albert M. Roehrig, of New York; William Mittelbach, of Missouri.

The President appointed Messrs. Payne, of Atlanta, and Ebert, of Chicago, to conduct the newly-elected President to the Chair. These gentlemen proceeded to perform that agreeable office, and escorted Mr. Lemberger to the platform amid the applause of the convention. Mr. Payne introduced Mr. Lemberger to the Chair and the members, and President Beal said:

Ladies and Gentlemen :

In the vernacular of the Bowery, I assure you Mr. Lemberger is the real cheese. (Applause and laughter.) Owing to the great similarity between my name and the name of the President-elect, and to our close personal resemblance to each other (!), the Committee on Nominations last year made a mistake; it was fully intended at that time that Mr. Lemberger was to be President, and not myself. (Laughter.) So it affords me very great pleasure at this time to assist in correcting that mistake.

Mr. Lemberger, it gives me the greatest pleasure to present you with this badge of office. (Pins the President's badge on his coat.) Perhaps it is not as ancient as the Golden Fleece, or the Order of the Garter, or various other things that might be named, but it is certainly the insignia most highly honored in American Pharmacy. I also take pleasure in presenting to you this gavel, by which you may enforce your authority. I trust it may never be used for any other purpose than enforcing a just and wise decision. (Great applause.)

Mr. Lemberger replied :

Mr. Chairman and Members of the American Pharmaceutical Association, Ladies and Gentlemen :

I feel very deeply sensible of the honor conferred upon me, and I think you will not blame me when I say to you that this is one of the proudest days in my life—as it ought to be to anyone who receives the exalted position of President of an association such as the American Pharmaceutical Association. I have been identified with this Association for quite a number of years, and have seen many very worthy men conducted to this office, and I am appalled at the thought that perhaps the Association has made a mistake in seeking me as its presiding officer; but we are too far on to recall it now.

You have been pleased to give me a very efficient cabinet; you have chosen some excellent men to assist me in conducting the affairs of the Association. I rest largely upon them, and can only promise at this time that it shall be my purpose, so far as possible, to conduct the office with fairness and to the very best of my ability. I feel very sure, Mr. Chairman—Mr. ex-President—that the Association made no mistake last year. It has done the very greatest kindness to me, as your successor, in placing in the chair one whose administration for the past year will ever be regarded as an ideal administration. (Great applause.) I hope, sir, at the end of my term I may have the approval of the Association, as I feel in my inmost soul you have.

I want to express my thanks again for this great mark of confidence, and I can only say in conclusion that I will do the very best I am able to. (Great applause.)

Mr. Lemberger took the chair.

The Chair requested the same committee to conduct Mr. Charles Holzhauer, of New Jersey, First Vice-President-elect, to the rostrum. The committee performed this duty, and Mr. Payne introduced the gentleman.

The Chair congratulated Mr. Holzhauer upon his elevation to the First Vice-Presidency of the Association, and reminded him that they had been pharmacists "from away back," and yoke-fellows in the work of the American Pharmaceutical Association for many years past. He expressed great confidence in his ability to do all that the President could do in the event the accidents of time should devolve the duties of the office upon him.

Mr. Holzhauer expressed his sense of the honor conferred by his selection to the office of Vice-President. He supposed the Nominating Com-

mittee felt, after selecting a little man for the Presidency, it would be necessary to even up the score by making a big one Vice-President. He had been a member of the Association since the Richmond meeting in the late sixties; had attended almost all of its meetings, and had learned to love many of the members of the Association and hold them as near and dear friends. He thanked the members from the bottom of his heart for the great honor they had put upon him.

At request of the Chair the committee next escorted Mr. Chas. A. Rapelye, of Connecticut, Second Vice-President-elect, to the platform, and Mr. Payne introduced him.

President Lemberger said Mr. Rapelye and he were not strangers to each other, and assured him of the very great pleasure he had in having him as one of his assistants during the year. He was quite sure there would be "no wooden nutmeg business" about him. Mr. Rapelye replied that while the position of Second Vice-President was largely honorary, he was none the less appreciative of the distinction conferred in his selection for the place, and he would try to fill it with credit to himself and the Association.

The committee escorted Mr. Godbold, of Louisiana, third vice-president-elect to the chair, and Mr. Payne introduced him. President Lemberger assured Mr. Godbold of the pleasure he had in having him one of his cabinet, and congratulated him upon being where he was at this time, instead of down in Louisiana fighting yellow fever microbes. Mr. Godbold made a humorous response, and told of the troubles the Nominating Committee had had with his name, finally getting it "Goldberg." He was confused as to whether he was the man really intended, and it was only after somebody said that the man they were after was from "Dixie" that he felt sure. He expressed his thanks for the honor, and promised to do the best he could for the welfare of the Association.

The Chair said it was customary to install the Treasurer and the General Secretary "at one sitting," so to speak, and asked the committee to conduct these gentlemen to the platform. Mr. Sheppard tried to escape this ordeal, but the committee found him and brought him forward. Mr. Payne said he had been a member of the American Pharmaceutical Association a good many years, and Mr. Ebert a great many more, and, so far as they knew, this was the first time Mr. Sheppard had ever been known to shirk his duty by being off the stage when he was wanted. Mr. Payne then introduced Mr. Sheppard and Mr. Caspari, though he said it would hardly seem to be necessary, as they had been repeatedly elected to the offices they held.

At this juncture Mr. Hynson, of Baltimore, caused a ripple by interposing an objection to the gentleman "from the windy city of the South" doing all the talking, and thought he ought to give his colleague (Mr. Ebert) from "the windy city of the West" a chance. Mr. Payne agreed to this,

and said he had tried to get the gentleman to be spokesman, as being from the larger city of the kind described, but he had refused.

The Chair in congratulating the officers-elect who had just been introduced took occasion to say there was no better watch-dog of the treasury in the world than S. A. D. Sheppard, and that the mantle of John A. Maisch had undoubtedly fallen on Chas. Caspari, Jr. (Applause.) It was one thing to pay compliments and quite another to state facts, and he was speaking now what he knew to be true.

Mr. Sheppard said that it fell to his lot this year to act as spokesman for "the twins," and he acquitted himself in his usual happy style. For himself and Mr. Caspari, he thanked the members most heartily for their renewed evidence of confidence, and proceeded to pay a handsome tribute to Mr. Caspari's peculiar qualifications for the place of Secretary. This was the twentieth time that he himself had been elected Treasurer of the Association, and he could only promise to do in the future what he had done in the past, keep the accounts correct. (Applause.)

At request of the Chair, the committee then conducted Mr. C. Lewis Diehl, of Kentucky, to the chair, to be installed as his own successor in the office of Reporter on the Progress of Pharmacy, and Mr. Ebert introduced him as one of the most faithful officers of the Association. President Lemberger took occasion to give the Association an object-lesson in presenting Mr. Diehl, by holding up before the members a copy of the Proceedings and calling attention to the fact that one-half of that volume represented the work of Mr. Diehl in his official capacity as Reporter on the Progress of Pharmacy. He had been elected, and elected again, and re-elected to this important post, because the Association had confidence in his ability to perform the work in the most efficient manner. Mr. Diehl expressed his thanks for this renewed evidence of the partiality of the Association, and pledged himself to present a report that would be useful not only to members of this organization, but of benefit to the pharmacists of the entire country. (Applause.)

The Chair called on the committee to conduct Mr. James H. Beal to the rostrum, saying the Association was not yet through with him. The gentleman came forward with his escort, and Mr. Ebert introduced him. The Chair reminded the members that the great work of the Association was conducted by the Council. He said Mr. Beal's services during the past year had been invaluable, and he was not surprised to find he had been elected to the Council, of which body he hoped he would be made chairman. Mr. Beal simply thanked the members briefly for the honor conferred in his selection.

The committee then brought forward Mr. A. M. Roehrig, of New York, who had also been elected to the Council, and Mr. Payne introduced him as not only a new member of the Council, but as a member of the United States Public Health and Marine Hospital Service. The Chair congratu-

lated Mr. Roehrig upon his selection for the important position of a member of the Council. Mr. Roehrig said he once had the temerity to tell an audience he was embarrassed, when a friend of his said that anything that would embarrass him would make a mule leave his oats. (Laughter.) But of course that was a libel. He paid a handsome tribute to the American Pharmaceutical Association as a grand and noble institution, guided as it is by the bright and shining lights of pharmacy, instructors of those who have the lives of the people of the community in their hands. He would gladly give his very best service in such a cause.

Mr. Mittelbach, of Missouri, the third member of the Council elected, was not present at the meeting and could not be formally installed.

This ended the formalities of installation.

Mr. Whelpley, Secretary of the Council, then read a number of amendments to the By-Laws that had been approved by that body, and which, under the rule, would have to lie over until the next session for action. The first was a proposition to amend the By-Laws in such a way as to give to persons joining the Association during the interim between annual meetings a copy of the Proceedings; another was to change the By-Laws so as to make provision for a Standing Committee on Time and Place of Meeting, the committee to be appointed by the incoming President; another involved merely a clerical change, to make the By-Laws show the number of members of the Council to be 23, as provided some time ago, instead of 22, as was formerly the case, while the last proposition to amend was to change the name of the Committee on National Legislation to Committee on National *and State* Legislation.

Mr. H. P. Hynson, of Baltimore, Chairman of the Committee on Exhibition, was then given permission to introduce to the Association the gentlemen in charge of the various exhibits in the hall where the session was being held. He called on each by name, and in due order, to come forward and address the convention briefly, and quite a number of them responded, though not all. The gentlemen who spoke expressed their appreciation of the opportunity given for displaying their wares before the members, and in turn they were treated with every courtesy by the Association. A pleasant incident of this part of the program was the presentation to Chairman Hynson by these gentlemen in charge of exhibits of a handsome pair of diamond-set link cuff-buttons and an Elks' badge as evidence of their appreciation of his untiring courtesy and kindly assistance in connection with their exhibits.

The Chair then called for a report from the Committee on Time and Place of Meeting, and Mr. Mayo of the Committee presented the following:

REPORT OF THE COMMITTEE ON TIME AND PLACE OF MEETING.

Your Committee on Time and Place of Meeting beg leave to report that cordial invitations were received to hold the next meeting of the Association at the following

places: Cincinnati, Indianapolis, Niagara Falls, Nashville, San Antonio, Texas., and Los Angeles, Cal.

The invitations to meet at Cincinnati came in the form of letters from the Cincinnati League, representing the commercial societies, the hotels, the railways, the merchants, the manufacturers and citizens generally, the Mayor, and the Ohio Valley Druggists' Association. Telegrams were also received from individual members. The committee was also addressed by Frank H. Freericks on behalf of the Ohio Valley Druggists' Association, and by H. J. Lohmann, of Newark, a former citizen of Cincinnati, urging the claims of that city.

The invitations from Indianapolis embraced letters from the Commercial Club, the Mayor, the County and the State Pharmaceutical Association, and from individual members. Mr. Carter appeared before the committee to convey these invitations and present the advantages of Indianapolis as a place of meeting.

Both these two places have many claims for consideration as the best place of meeting, and in fact these claims are so evenly balanced that your committee begs leave to submit the two names for the consideration of the members, leaving the Association itself to decide by ballot.

The experience of this committee proves that the interest of the Association would best be served by making the committee a standing one, to be appointed by the incoming president, and your committee respectfully recommend that the Council be instructed to make such changes in the by-laws as may be required to bring about this change.

The committee refers the invitation from Niagara Falls to the Secretary for acknowledgment.

Respectfully submitted,

A. E. EBERT, *Chairman*,
C. G. MERRELL,
F. C. GODBOLD,
F. E. STEWART,
CASWELL A. MAYO, *Secretary*.

Mr. Sheppard moved to receive, and Mr. Eliel seconded the motion, but with the understanding that action on the report would be taken at the next session.

Mr. Lohmann, of Jersey City, objected to any delay in the matter, and moved to proceed at once to decide the place of next meeting definitely, inasmuch as the committee had failed to recommend any place, owing to the closeness of the contest between Cincinnati and Indianapolis, as they saw it. This motion was seconded by Mr. Payne and carried.

A lively discussion was then precipitated upon the relative merits and claims of Cincinnati and Indianapolis for the honor of being selected as the place of meeting in 1906, Mr. Lohmann, of New Jersey, leading the fight for Cincinnati in an eloquent plea of some length. Mr. Sheppard, of Boston, warmly seconded the proposition to meet in Cincinnati. Mr. Payne, of Georgia, and Mr. Hopp, of Ohio, also seconded this motion.

Mr. Hynson thought the matter too important to be disposed of in this way, and moved that it be referred to the Council. Mr. Eliel objected to this suggestion, upon the idea that the Council was in no better position to settle the matter than the Association in general session, and said the same straw would have to be threshed over again in open session if it went to the Council.

Mr. Mayo moved as a substitute for Mr. Hynson's motion that the Association proceed to ballot on the place of meeting. He said he did not mean to cut off debate, and that the relative merits of the two places could be set forth in discussing his motion.

After some further discussion of the subject by Messrs. Hynson, Lohmann, Mayo and Whelpley, the Chair put the vote on Mr. Hynson's motion and it was lost.

The advocates of Indianapolis as the place of next meeting, led by Mr. Frank H. Carter, of that city, and ably seconded by Mr. Eliel, of South Bend, then took the floor. Mr. Hancock, of Baltimore, also spoke for Indianapolis, while Mr. Hallberg, of Chicago, made "a talk to *both* places," as he expressed it.

The Chair then put the vote on the motion of Mr. Mayo to proceed with the balloting, and the motion prevailed. The Chair appointed Messrs. Alpers and Whelpley tellers to take and count the vote. At the suggestion of Mr. Ebert, in order to avoid any misunderstanding, or the claim that any unfair advantage was used, the members were directed to write their names on their ballots. As the result of the vote cast, the tellers announced that Indianapolis had received 51 votes and Cincinnati 11. Thereupon, Mr. Lohmann moved to make the selection of Indianapolis unanimous, and the motion was put and carried.

The Chair called for expressions as to the date of holding the meeting, and Mr. Sheppard, with Mr. Whelpley as a second, moved to make it the first Monday in September. Mr. Hallberg entered his "perennial protest" against the first week in September, on account of its conflicting with the opening of the schools in the middle west, a busy time with the druggists. The question was further discussed by Messrs. Payne, Ebert, Carter, Eliel, Lohmann and Sheppard. The question was then put on Mr. Sheppard's motion to fix upon the first Monday in September as the date for the meeting, and it carried unanimously.

There being no further business before the Association at this time, on motion of Secretary Caspari, an adjournment was taken to 10 o'clock to-morrow morning.

Twelfth Session—Saturday Morning, September 9, 1905.

The Association was not called to order by President Lemberger until 11 : 20 a. m., on account of a protracted session of the Council.

As the first order of business, the Secretary read the minutes of the second general session, held on Tuesday morning, which, on motion of Mr. W. C. Anderson, were adopted as read. The Secretary then read the minutes of the third general session, held Friday afternoon, for the installation of officers, and, on motion of Mr. Beal, they were approved as read.

On motion of Mr. Sheppard, of Boston, the question of the adoption of certain proposed amendments to the by-laws, offered at yesterday afternoon's session, and bearing the approval of Council, was taken up. Mr. Sheppard explained that these changes were all of minor importance, involving a mere clerical correction to make one part of the By-Laws consist with another, except the amendment providing for the appointment of a Standing Committee on Time and Place one year in advance of the next meeting, instead of having the committee appointed at the first session of the annual meetings, as heretofore, the object being to give the committee a longer time in which to thoroughly consider the question of the most desirable meeting-place, all things considered.

The Chair said that Mr. Sheppard had well stated the effect of the proposed changes, and that the amendments would be acted on without reading, unless a contrary course was insisted on. There were calls of "question!" and Mr. W. C. Anderson moved the adoption of the four amendments as already submitted in writing. This motion was seconded by Mr. A. M. Roehrig and carried.

The Chair called on the Secretary of the Council to read the minutes of that body since his last report, and Mr. Whelpley stated that, without objection, he would merely give a synopsis of the minutes, which were of some length, to save time. Thereupon he presented an abstract of the minutes of the fifth, sixth and seventh sessions of the old Council, the full text of which here follows:

Fifth Session of Council.

Chairman J. H. Beal called the Council to order at 10:30 a. m., September 6, 1905 with a quorum present.

On motion, applicants for membership, Nos. 187 to 190 inclusive, were duly elected.

The following report of the Committee on Publicity was submitted by Chairman Francis B. Hays, and, on motion by C. Lewis Diehl, it was referred to a committee of two to consider and report upon the recommendations made. The Chair named Lewis C. Hopp and E. H. Gane as members of the committee.

Report of the Committee on Publicity.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

This is a new committee, appointed in the spring. Its instructions were (1) to suitably advertise this meeting, and (2) to report at the same a plan for the organization and work of a permanent committee on publicity.

As soon as the chairman was notified of the appointment of the committee, he communicated with his eleven fellow-committeemen, informing them of their appointment and asking for their advice and coöperation. Most of them replied, saying that of course they would do what they could to advertise the meeting, and one at least made some suggestions to which more detailed reference is made in this report.

Next the chairman prepared a little folder, intended to set forth some of the attractions which Atlantic City would hold for druggists this week, and inviting application for membership. One result of the circulation of this folder was several requests for blank applications for membership, one of which was returned to the chairman, properly

signed, together with a check for $5; doubtless others went direct to the secretary of your Committee on Membership.

Several of the State pharmaceutical associations had held their meetings for this year before the work of the committee was launched. The presidents of the other State associations were requested to mention this meeting in their addresses; each of the secretaries of the associations was requested to read a copy of the folder in his meeting, as a "communication;" and some prominent A. Ph. A. man in each State was requested to see that when the matter came before his State association, it was impressed upon the minds of those present by discussion.

In addition to this, copies of the folder were sent to the various State meetings for distribution; still others were sent out by the secretaries (with notices, etc.), in this way reaching members of the State associations who did not attend their meetings.

Copies of the folder were sent to all the pharmaceutical journals, with the request that they give publicity to the matters therein touched upon. The responses to this request were generous.

About 5,000 of the folders were sent out from the chairman's office, enclosed with other mail for as many druggists, thus reaching many non-members of associations, at no expense for postage and mailing. It is doubtful, however, whether the druggists who are not members of State associations, or who do not read the pharmaceutical journals are the kind of timber which it pays us to work upon. Still we cannot always tell, and every little helps.

General newspaper publicity was sought in three ways (1) By request to every one who received the folder (printed thereon) to ask his local papers to mention the meeting; (2) through the newspaper correspondents at Atlantic City—this part of the work having been very kindly undertaken by the local secretary, Mr. W. C. Wescott; and (3) through the Associated Press. The result of this portion of the campaign was not particularly gratifying. The only recipient of the folder who notified the chairman that he had complied with the request to have his local papers announce the meeting was Mr. S. W. Williams, of South Orange, N. J., who prepared good notices and secured their publication in four papers in and near his city. Mr. Wescott reports that he secured some publicity through Atlantic City correspondents. Mr. Melville E. Stone, head of the Associated Press, told the chairman that it was an invariable rule of his organization not to announce meetings in advance. However, when the chairman had his attention he enlightened him as to the aims and accomplishments of this association, and hopes that some indirect benefit may accrue to to us from the interview.

There was a greater demand for the folders than the chairman anticipated, so that he had to return to the printer twice for a supply. The cost of three lots of the folders was a little more than if the entire 12,000 had been run off at once, but the chairman hopes he will be forgiven for incurring this additional expense, as he did the best he could with the light he had.

The suggestion that some A. Ph. A. member at the various State meetings be requested to discuss the announcement of the present meeting when made by the president or secretary, came from Mr. Henry Kraemer, a member of the committee. A part of his suggestion was that the presidents and secretaries be requested to make these announcements, but this the chairman had already done. Mr. Kraemer also thought it would be well for the chairman to gather from the various committees of this Association monthly reports of the progress of their work, put these in attractive, readable shape, and send a copy of the paper to each of the drug journals. The committee endorses the suggestion, but unusual and pressing duties have so occupied the chairman's time that it has been impossible for him to act upon them. He hopes the chairman next year and in after years —should a committee on publicity be established permanently—will have more time and can do better work than he has been able to do.

Another idea was advanced by a valued member of this Association, not a member of the committee, Mr. E. H. Gane. Mr. Gane thinks that the Association could do a good work for the druggists, and gain much publicity and many members by systematically and publicly refuting the numerous and notoriously stupid and mendacious newspaper accounts of matters in which druggists are interested. He thinks that this committee might undertake the work, but partly for the reason just mentioned, and partly because the chairman has some doubts as to such work being properly within the province of this committee, nothing has been done by it along this line. The suggestion seems to the committee, however, to be a good one, and it passes it along to the Council in the hope that some action may be taken concerning it.

As to the second half of the committee's duties, namely, reporting a plan for the organization and work of a permanent committee on publicity, it can only point to what has already been done, and suggest more thoroughness and such improvements, other than already mentioned, as experience may dictate.

The committee feels that it can not forego this opportunity to congratulate the Council upon its awakening to the importance of coöperating with the press in the matter of disseminating news about its work, among those who are or should be members of the Association, which awakening is manifested not alone in the appointment of a committee on publicity, but also, and in even a greater degree, by the sending of monthly news letters to the pharmaceutical journals. The press has always stood ready to do its part.

Respectfully submitted,

H. M. Whelpley,
Harry B. Mason,
Edward Kremers,
Henry Kraemer,
Caswell A. Mayo,
Francis B. Hays, *Chairman.*

On motion, the Council adjourned.

Sixth Session of the Council.

The Council was called to order by Chairman J. H. Beal at 10 a. m., September 7, 1905, with a quorum present. The minutes of the fifth session were read and approved. The following report of the chairman on the invested funds of the Association was read and ordered filed.

Report of the Chairman of the Council on the Funds of the Association.

Gentlemen: The investment in Massachusetts State Bonds and the deposit with the Boston Penny Savings Bank to the credit of the Ebert, Centennial and William Procter, Jr., Funds are at this date, June 30, 1905, as follows:

The Ebert Fund.

On deposit with the Boston Penny Savings Bank	$921 36

The Centennial Fund.

On deposit with the Boston Penny Savings Bank	$1,023 99
1 Mass. State 3 per cent. bond, No. 1705	1,000 00
Total	2,023 99

The William Procter, Jr., Fund.

On deposit with the Boston Penny Savings Bank	$1,721 83
1 Mass. State 3 per cent. bond, No. 1701	10,000 00

1 Mass. State 3 per cent. bond, No. 1702	1,000 00
1 Mass. State 3 per cent. bond, No. 1703	1,000 00
1 Mass. State 3 per cent. bond, No. 1704	1,000 00
Total	$14,721 83

SUMMARY.

Ebert Fund	$921 36
Centennial Fund	2,023 99
Procter Fund	14,721 83
Total, June 30, 1905	$17,667 18

J. H. BEAL, *Chairman of the Council.*
MARY L. CREIGHTON.

STATE OF OHIO,
COUNTY OF HARRISON, } *SS.*

Before me, a Notary Public in and for said County and State, personally appeared the above named J. H. Beal and Mary L. Creighton, who made affidavit that they have counted and examined the bonds, and examined the entries in the bank books of the Boston Penny Savings Bank, and that the said bonds and entries correspond to the statement above set forth, to which they have attached their names.

Sworn to before me and subscribed in my presence this 30th day of June, 1905.

JAMES M. SPIKER,
[SEAL.] *Notary Public.*

On motion, applicants for membership Nos. 191 to 197 inclusive were duly elected.

The following report was read by Chairman J. H. Patton and, on motion, adopted.

To the American Pharmaceutical Association:

Gentlemen: The committee appointed to audit the accounts of the General Secretary and Treasurer have performed that duty, and report that they have carefully examined the books and vouchers and find them correct.

The Secretary has received from the sale of

Proceedings	$201 85
Semi-centennial index	144 68
Badges and bars	102 95
Total	$449 48

which has been paid to the Treasurer and his receipt taken therefor.

The Treasurer has received from all sources	9,277 51
Balance on hand, June 30, 1904	3,424 66
Total	$12,702 17
Disbursements	8,606 99
Balance on hand, June 30, 1905	$4,095 18

The permanent funds consist of the following:

Ebert fund	921 36
Centennial fund	2,023 99
Procter fund	14,721 83
Total	$17,667 18

We would recommend, as did the Auditing Committee one year ago, that the Secretary keep a general cash book, thereby facilitating the work of the auditors.

JOHN F. PATTON, *Chairman,*
GEORGE A. GORGAS,
GUY S. BOYD.

On motion by S. A. D. Sheppard, seconded by H. M. Whelpley, a committee, consisting of the Chairman of the Council, the General Secretary and the Secretary of the Council, was appointed to invite and receive bids for the publication and sale of the National Formulary, this committee also to report upon a plan to permit the use of the text of the National Formulary by the publishers of pharmaceutical and medical works.

Moved by Chas. Caspari, Jr., seconded by H. M. Whelpley, that Article II of Chapter VII be amended by striking out all after the word "prior" in the last line, and substituting therefore the following: "during the time between July 1st of one year and July 1st of the year following shall be considered as of the current fiscal year."

Motion adopted.

Moved by S. A. D. Sheppard, seconded by H. M. Whelpley:

1. That there be established the office of Reporter to the Public Press.

2. That the Reporter to the Public Press shall be elected annually by the Council.

3. That the duties of the said Reporter shall be to report to the Associated Press and other news agencies all news items and matters important to the Association, both at the annual meetings and during their interim.

Motion adopted.

On motion, the Council adjourned.

Seventh Session of the Council.

In the absence of Chairman J. H. Beal, Vice-Chairman C. Lewis Diehl called the Council to order at 10 a. m., September 8, 1905, with a quorum present. The minutes of the sixth session were read and approved.

Applicants Nos. 198 to 207 inclusive were elected to membership.

On motion by H. M. Whelpley, seconded by S. A. D. Sheppard, the Committee on Publication was instructed to publish a picture of Dr. Albert B. Prescott as frontispiece to the 1905 volume of the proceedings.

Lewis C. Hopp read the following report of the committee to consider the Report of the Committee on Publicity:

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Your committee appointed to consider the Report of the Committee on Publicity and to suggest a plan for the organization and work of a permanent committee presents the following:

We appreciate the work which the present committee has done in suitably advertising the present meeting, but we think that the sphere of activity of the permanent committee on publicity should be of much wider scope. The ultimate object of such a committee is, of course, to secure additional members and prestige for this Association. Two methods of gaining this objective naturally present themselves. The direct method of soliciting and of advertising is already being attended to and can well be left to the various officers of the Association, and to the trade press, which is always willing to lend us its support.

The Committee on Publicity might, however, aid this work by adopting Dr. Kraemer's suggestion of obtaining early information of matters to be brought up at the next annual meeting, and presenting it in readable form to the various trade journals. This would also serve as a stimulus to the section officers and aid in securing additional papers of of value and sometimes in preventing duplication of certain lines of work. The papers to be presented should be announced in advance of the meeting. This would at times be an inducement to members to attend when subjects in which they are especially interested are to be discussed.

The chairman of such a committee should further attend to the preparation of brief notes of general interest concerning the work of the Association for presentation to the local press at points where the annual meeting is held. He should also pay attention to the proceedings day by day, and keep the reporters in attendance informed on the chief matters of general interest to be discussed. In other words, he should act as press agent for the Association upon all general occasions.

The chief work of this committee should, in our opinion, be the inauguration of a campaign in the daily press, first to keep prominently before the public the special usefulness of the pharmacist to them; second, to refute immediately inaccurate and mendacious references to matters in which druggists are interested; third, to keep the public warned against dangerous adulterations, such, for example, as the use of wood alcohol in preparations for internal use, and to point out the necessity of the public confining their purchases to reputable pharmacists; fourth, to keep watch on the reports of the State food and drug bureaus, and to correct the misleading deductions frequently drawn therefrom; fifth, to warn the public against palpable frauds in medicines, and to prevent as far as possible the fraudulent exploitation of the latest advances in medicine and science. Finally, it might be possible later to furnish the bureaus which prepare plate matter of general interest for local papers with short notes of general scientific interest which would tend to increase the sale of legitimate pharmaceutical or hygienic products.

A campaign of this kind could only be conducted at some personal sacrifice on the part of the members of this Association, and we therefore recommend that in organizing a committee on general publicity that the president of the Association appoint a chairman of "the general committee on publicity," the latter to appoint his own associates, subject to approval by the Council of the Association. The chairman should preferably be a resident of one of the largest cities, and he should appoint associates in the large cities throughout the country from time to time as the work progresses. We suggest that these various members should have power to form local committees for the same ultimate purpose in order that prompt action, which is so needful in carrying out this work properly, may be obtained. The members of these local committees also to be subject to the approval of the Council.

The various members of the general and sub-committees on publicity should have power to sign all communications sent to the press in the name of the American Pharmaceutical Association. This would carry additional weight in replying to attacks on the reputation of the retail druggists, and should in time materially enhance the reputation of this Association, and, by showing the retailer that the Association is alive to its own interests, would materially aid us in securing new members.

We also recommend for your consideration, now that the Association has decided to establish the American Pharmaceutical Association Bulletin, that the number issued previous to the holding of our annual meet, be an ante-convention number, said Bulletin to contain:

Announcements of annual meeting.

Place of meeting and such description as may be necessary.

List of hotels, and their rates.

Side trips, if any.

Railroad rates and routes.

To defray expense of editing, publishing and mailing said Bulletin, the committee or committeeman in charge should solicit advertisements, said advertisements to be passed upon by a committee to be appointed for said purpose.

[Rates for such space should be sufficiently high to not only cover all cost, but also to net the Association a handsome sum to help defray all expenses incident to the holding of the annual meeting.]

Application Blank.

Objects and principles of our Association.

Officers of the Association.

List of Sections, with officers.

Invitations to druggists receiving the Bulletin to join our Association, together with reasons why a practicing pharmacist should join.

The Bulletin to be sent to every *registered* pharmacy in this country.

C S. N. Hallberg moved, and H. M. Whelpley seconded, that all reference to advertisements be stricken out of the report. The motion was discussed by Messrs. Sheppard, Hallberg, Caspari, Jr., Eliel, Hynson and Lemberger. On vote, the motion was carried.

On motion by S. A. D. Sheppard, the report was adopted as amended.

On motion by S. A. D. Sheppard, seconded by Charles Caspari, Jr., the editor of the A. Ph. A. Bulletin was authorized to solicit financial contributions for the publication of the pre-convention number if the Committee on Finance finds it necessary to do so. The editor was instructed to duly acknowledge such contributions in the pre-convention number in case they are solicited.

On motion by E. H. Gane, the Reporter to the Public Press was made Chairman of the Committee of Publicity and editor of the A. Ph. A. Bulletin.

On motion by C. S. N. Hallberg, seconded by H. M. Whelpley, an honorarinm of $500 is to be paid C. Lewis Diehl, chairman of the Committee on National Formulary.

On motion by E. G. Eberle, seconded by S. A. D. Sheppard, it was expressed as the opinion of the Council that the $500 honorarium voted to Chairman Diehl, of the Committee on National Formulary is not full compensation for his work, and the Council be expected at the 1906 meeting, after the National Formulary is printed, to carefully consider the payment of an additional amount.

Charles Caspari, Jr., submitted the following report of the Committee on Publication, and it was ordered filed:

REPORT OF THE COMMITTEE ON PUBLICATION.

Mr. Chairman and Members of the Council of the American Pharmaceutical Association:

Your Committee on Publication beg leave to report that the Proceedings of the fifty-second annual meeting have been published and a copy of the same delivered in March of the present year and since that time to every member entitled thereto, according to the Treasurer's accounts, besides the usual number (about 100) of complimentary copies to the honorary members, state libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Of the total number of books (1750) printed, 269 copies remain on hand in flat sheets, 1426 having been bound in cloth and 55 in paper. It was also found necessary during the past year to bind in cloth 100 copies of the 1903 volume of Proceedings, the stock having become exhausted. The cost of publication and delivery for the year 1904–1905 is shown by the following items:

Composition, paper, and press work (1750 copies)		$2,033 92
Binding 1,426 copies in cloth (1904) @ 23 cents	$327 98	
" 100 " " (1903) @ 23 cents	23 00	
" 55 " paper (1904) @ 8 cents	4 40	
		355 38
Expressage and Postage: Expressage (cloth 24, 35; paper 25); Postage (cloth 26; paper 25)		388 28
Illustrations		50 80
Journals for the Reporter (Foreign)		30 39
Salary of the Stenographer		200 00
Salary of the Reporter on the Progress of Pharmacy		675 00
		$3,733 77

Your Committee are much pleased to be able to report that the Collective Index of the first fifty volumes of Proceedings has been published. One thousand copies were printed, of which 250 have been bound in cloth, 250 gathered and stitched, and 500 remain in folded sheets. The total expense connected with the publication of the Index to date has been $1,871.01, against which $1,781.34 have thus far been received, including $341.66 insurance money for destruction of manuscript in the Baltimore fire of 1904.

For the Committee, CHAS. CASPARI, JR.,
Chairman.

Baltimore, July 15, 1905.

Moved by Chas. Caspari, Jr., and seconded by E. G. Eberle, that the name of the Committee on National Legislation be changed to Committee on National and State Legislation. Motion carried.

The following resolution offered by S. A. D. Sheppard, and seconded by Chas. Caspari, Jr., was adopted:

WHEREAS, The Association will receive a large sum from the proceeds of the exhibition held at Atlantic City, and it is always in order to settle accounts whenever possible, it is the sense of the Council that the money so kindly advanced by the Bulletin of Pharmacy, American Druggist, Druggists' Circular and Merck's Report to help this Association in the publication of the Semi-centennial Index should now be paid back to said journals, and the Treasurer is hereby instructed to pay the sum of $325.00 to each of the above-named firms, and extend the thanks of the A. Ph. A. tor the favors shown.

On motion by Leo Eliel, seconded by J. L. Lemberger, it was expressed as the sense of the Council that the 10 per cent. reduction from the usual amount in salary for two years made last year by direct vote, and this year by reducing the appropriation, is only tentative, and the officers should be reimbursed as soon as the Association is in a position to do so.

On motion by S. A. D. Sheppard, the By-Laws were changed so that provision is made for a standing committee on Time and Place of Meeting, the committee to be appointed by the incoming president.

On motion by S. A. D. Sheppard, the By-Laws were changed so that the Council shall consist of twenty-three in place of twenty-two members.

On motion by H. M. Whelpley, seconded by E. H. Gane, it was expressed as the sense of the Council that the practice of issuing delegate blanks should be continued.

On motion, C. S. N. Hallberg was unanimonsly nominated as chairman of the Committee on Publicity and reporter to the public press.

On motion, the Council adjourned.

Mr. Whelpley then read the minutes of the first session of the new Council, organized this day with Mr. James H. Beal as Chairman, Mr. W. C. Alpers, Vice-Chairman and Mr. H. M. Whelpley as Secretary:

FIRST SESSION OF THE NEW COUNCIL.

The Council was called to order by retiring Chairman J. H. Beal at 9:30 a. m., September 9, 1905, with a quorum present. The minutes of the ninth session of the old Council were read and approved.

On motion, the Council proceeded to reorganize with the following result:

Chairman—James H. Beal, Scio, Ohio.

Vice-Chairman—William C. Alpers, New York City.

Secretary—H. M. Whelpley, St. Louis.

On motion by Leo Eliel, seconded by J. L. Lemberger, the sum of seventy-five dollars was appropriated for expenses of the Secretary of the Council.

On motion by Leo Eliel, the motion of the ninth session of the Council which com-

bined the editorship of the A. Ph. A. Bulletin, the chairmanship of the Committee on Publicity and the reporter to the public press was reconsidered.

On vote, it was decided to have the three positions remain separate.

On motion, the motion of the ninth session of the Council making C. S. N. Hallberg reporter to the public press, Chairman of the Committee on Publicity and editor of the A. Ph. A. Bulletin was reconsidered.

On motion, C. S. N. Hallberg was unanimously elected editor of the A. Ph. A. Bulletin.

On motion by C. Lewis Hopp, Francis B. Hays was made reporter to the public press.

On motion by S. A. D. Sheppard, it was expressed as the sense of the Council that the President-elect should appoint the Chairman of the Committee on Publicity.

On motion by E. G. Eberle, it was decided that in case the funds in the hands of the local Secretary are not sufficient to pay the expense incurred by Dr. Charles Baskerville's lecture on radium, the Treasurer is to be instructed to pay the amount or such portion of it as is necessary.

Charles E. Caspari introduced the following resolutions:

1. *Resolved*, That the Scientific Section request the Council to adopt the principle of simultaneous sessions of sections.

2. *Resolved*, That the Chairman of the Scientific Section be instructed to request the Council to grant three sessions to this section at the next annual session.

On motion, the resolutions were referred to a committee of three. The Chair named for this committee: Charles Caspari, Jr., Frank H. Carter and Joseph L. Lemberger.

On motion by Chas. Caspari, Jr., it was ordered by the Council that the chairmen of the respective sections be directed to notify the General Secretary of the titles of all papers to be read at the annual meeting not later than six weeks preceding the date of said meeting, and that no papers be printed for the meeting which have not been presented at least four weeks before opening of the meeting.

The Chair announced the following committees:

Finance—Charles Holzhauer, J. F. Hancock and H. P. Hynson.

Publication—Charles Caspari, Jr., C. Lewis Diehl, Leo Eliel, Charles E. Caspari, C. A. Rapelye.

On motion by S. A. D. Sheppard, seconded by H. M. Whelpley, Frank H. Carter was elected Local Secretary for the 1906 meeting.

On motion by H. M. Whelpley, seconded by S. A. D. Sheppard, the Local Secretary was made chairman of the local committee on arrangements and instructed to name his associates on the committee.

On motion, the Council adjourned.

Mr. Alpers, seconded by Mr. Lohmann, moved that the minutes of the several sessions of the Council as read be approved.

The General Secretary called attention to the order passed by the Council directing the Chairman of the Exhibition Committee to notify the Secretary at least six weeks prior to the annual meeting of the details of his exhibit, to the end that they might be published in the Official Bulletin in advance of the meeting. This period of time would be necessary, in order that the Secretary might have time to give the proper notice to the editor of the Bulletin. The Secretary also called attention to the requirement that all papers to be printed for distribution should be in the hands of the Chairman of the Section at least four weeks before the meeting.

This rule was made necessary by the fact that a large number of papers were often rushed into the printer's hands only two or three days before the meeting, when it was impossible for the printer to do his work or for the Secretary to read the proof. All other papers may be delivered to the Chairman at such time as he may direct.

The motion to adopt the minutes of the Council was then put and carried.

Mr. Ebert, of Chicago, here called the attention of the Chair to what he thought was an oversight in not recognizing the Delegation from the National Association of Retail Druggists at the first session, on Monday afternoon. The Secretary stated that President Beal at the time had announced that the Association would be glad to hear from any of the delegates whose names had been called. He said he held in his hand a communication from that delegation, signed by its Chairman, Mr. Arthur Timberlake, of Indianapolis, which had been turned over to him to be read at the proper time, for the express reason that the Chairman of the delegation could not be present at the opening session. Thereupon the Secretary read the following:

The N. A. R. D. extends its greetings and the right hand of fellowship to the A. Ph. A. and earnestly hopes that the deliberations of this meeting will be both profitable and enjoyable.

From the very day the corner-stone of the N. A. R. D. was laid, it has been by many of its founders the earnest desire and cherished thought, that the two organizations should be more closely united; that the objects and needs of legislative achievements could be more easily obtained, and that the evils of both the scientific and commercial sides of our profession might be eliminated more rapidly, and even to a higher plane tha now exists.

I realize as fully as any of you the difference in the character of the work of each body, its aims, its goal. Has either body ever reached the climax of its anticipation? No But by united efforts, unanimous and persistent action, nothing that we might ask of State or Nation, that has sound reason, that has justice and good logic behind it, will be denied us.

A. TIMBERLAKE.

Mr. Beal moved to receive and spread upon the minutes, and in that connection explained that not only was the delegation from the N. A. R. D. called on from the President's desk at the first session, but the Chair inquired whether Mr. Timberlake was in the room, and if he was the Association would be glad to hear from him. The motion to receive the report was then seconded by Mr. Payne and carried.

The Chair stated that if there were any other members of this delegation present the Association would be glad to hear from them, but there was no response.

Mr. Sheppard called attention to the fact that the Council had nominated for editor of the new Association Bulletin proposed to be published Mr. C. S. N. Hallberg, of Chicago, and moved that the Secretary cast the

affirmative ballot of the Association electing Mr. Hallberg to that office. This motion was seconded by Mr. Patton and Mr. Lohmann and carried unanimously. The Secretary stated that he had cast the ballot as directed, and the Chair expressed to Mr. Hallberg the great pleasure he had in announcing his election to this position, and trusted he could see his way clear to an acceptance. Mr. Hallberg said he had not been consulted about the matter, and, though he rarely took things seriously, this was a serious thing to him, and he did not know whether he would be able to do the work or not. Mr. Ebert said he had declared he would be responsible for Mr. Hallberg's acceptance, and that as he had told him "something was going to happen," he could not complain now that it had happened. Mr. Hallberg replied that now that the "principal" had spoken, there was nothing to do but to sit down.

Mr. Alpers said that he noticed in the rush of business no appropriation had been made for the editor of the Bulletin, and moved that an appropriation of $200.00 for that purpose be made, experimentally, for the ensuing year. Mr. Sheppard seconded this motion, with the understanding that it was not known how much more than $200.00 would be required to make fair compensation for the work. Mr. Cohn, of New York, wanted to know what course would be pursued if the $200.00 should prove insufficient, and Mr. Eliel and the Chair stated that the Council would take care of that matter. The motion of Mr. Alpers was then put and carried.

Mr. Whelpley announced that since yesterday's installation of officers a local secretary for next year's meeting had been elected by the Council in the person of Mr. Frank H. Carter, of Indianapolis, and he thought the gentleman should be given an opportunity to say something. The Chair invited Mr. Carter to address the Association, and he did so briefly. He said that what was expected of the local secretary was deeds, not words, and he would leave it to the Association to decide whether it had selected the right man for the place after the first week in September, 1906.

Mr. Whelpley called attention to the fact that in the elevation of Mr. Joseph L. Lemberger to the place of chief executive of the Association a vacancy in the Council had been created, and he would like to move the election to that vacancy of one of the most faithful and strenuous workers in the American Pharmaceutical Association, Mr. Edward Kremers, of Madison, Wis. Mr. Eliel seconded this motion, and Mr. Sheppard moved that nominations be closed, and the motion prevailed. Mr. Kremers was then unanimously elected a member of the Council by a *viva voce* vote. The gentleman made his escape from the room, however, about this time, and no speech could be had from him then.

Mr. Sheppard offered the following:

Resolved, That this Association express its appreciation of the presence of representatives of governmental departments at the Atlantic City meeting; and be it further

Resolved, That the General Secretary be instructed to convey to the Secretary of

Agriculture and to the Surgeon-General of the Public Health and Marine Hospital Service our appreciation of the work done at Washington, of the papers presented to the Scientific Section, also of the exhibitions made at this meeting by the respective representatives of the government.

Mr. Hynson seconded the resolution just offered, and it was adopted unanimously.

At this point, in connection with the communication from the delegation of the N. A. R. D. read by the General Secretary at this session, Mr. C. G. Merrell, of Cincinnati, made a strong plea to have the meetings of the N. A. R. D. and the A. Ph. A. brought closer together, to the end that a larger attendance on each might be had. He knew personally of a number of instances where parties desired to attend both meetings, but were prevented by the difference in time between the two meetings. He thought it would be in order for this Association to request the N. A. R. D. to consider the advisability of meeting next year at Indianapolis or some near-by point just before or just after the meeting of this Association. The fact that this Association met first this year would seem to make it proper that the suggestion should come from this body.

Mr. Payne, of Atlanta, seconded this motion, and Mr. Godbold, of New Orleans, heartily endorsed the suggestion. He said he would like to go to Boston to the N. A. R. D. meeting, but the space of a week between this meeting and theirs would preclude him from doing so.

Mr. Eliel, of South Bend, proceeded to give a brief outline of the history of the old National Retail Druggists' Association, organized in Washington in 1883, immediately before the meeting of the American Pharmaceutical Association for that year. In 1884, '5 and '6 the Retail Association also held its annual meetings just before this Association. The result was that the National Retail Druggists' Association was "gobbled up" by the American Pharmaceutical Association in 1886, and is now represented in this Association by the Commercial Section. He feared a repetition of this bit of history if the idea of the speakers was carried out, only he was afraid that it would be the National Association of Retail Druggists that would do the gobbling this time, and he "didn't want to be gobbled—not yet."

Mr. Merrell, in reply to Mr. Eliel, said the conditions were very different now from then, and said he thought each Association recognized the value and importance of the other, and that this idea was so firmly established that there would be no difficulty along the line suggested.

Mr. H. B. Mason pointed out that the N. A. R. D. had always taken the ground that there were reasons compelling it to meet at certain, definite places, in certain, definite years, local conditions determining that, and it could not arrange a time and place to accord with the views of this Association. He moved, therefore, that it be suggested to the N. A. R. D. that when it decided to hold a meeting near the place decided on by this

Association, a conference be had and the two meetings held in two consecutive weeks.

Mr. Merrell indicated his acceptance of this suggestion.

Mr. W. C. Alpers said he was in favor of this arrangement if it could be made, but he feared it might interfere seriously with the desire of some of the members of this Association to utilize the extension of time on convention tickets, after the business sessions were over, to visit other portions of the country in reach of the meeting-place.

The Chair suggested that the motion of Mr. Merrell was to request the N. A. R. D. to meet just *before* or just *after* the meeting of the A. Ph. A.

The motion of Mr. Merrell as amended by Mr. Mason was then put to a vote and carried.

The Secretary read a communication from Mr. John Uri Lloyd, of Cincinnati, expressing regret at his inability to be present, and called attention to some reprints of a paper by Mr. Lloyd, that it was the purpose to have read before the Section on Scientific Papers, but the paper came too late. He also read a telegram of regret from Prof. William Simon, of Baltimore.

Mr. Beal said he understood there were several papers by Mr. Lloyd that had been received too late for consideration by the Sections to which they applied, and if there were such he would like to move that they be read by title and referred for publication. The motion was seconded by Mr. Mayo and carried.

Mr. Hynson, as chairman of the special committee to which was referred the matter of recommendation by the Council of the name (among others) of a certain party as a member of this Association, at the first session, moved to discharge the committee, as the Council had already elected the gentleman a member.

This motion was seconded by Mr. Hancock and carried.

The Secretary read the report of the special committee to which was referred the Report of Delegates to the Section on Pharmacology of the American Medical Association:

REPORT OF COMMITTEE APPOINTED TO CONSIDER THE "REPORT OF THE DELEGATES TO THE SECTION ON PHARMACOLOGY OF THE AMERICAN MEDICAL ASSOCIATION."

To the President and Members of the American Pharmaceutical Association, Gentlemen:

Your Committee on the Report of Delegates to the Section on Pharmacology of the American Medical Association, at the fifty-sixth annual meeting, at Portland, Oregon, July 11–14, 1905, beg leave to report that they have also had referred to them that portion of the address of the Chairman of the Section on Scientific Papers, that refers to the recently established Council on Pharmacy and Chemistry of the American Medical Association. After carefully considering the report of the delegates from this Association as well as the reference in the annual address of the Chairman of the Section on Scientific Papers, your committee would respectfully recommend the adoption of the following resolutions:

Resolved, That the American Pharmaceutical Association, in general meeting assembled, commends all proper efforts on the part of the American Medical Association to differentiate between the various so-called proprietary remedies with a view of correcting the abuses at present existing in connection with the advertising pages of medical journals.

Resolved, That a copy of this resolution be forwarded to the Secretary of the American Medical Association.

GEORGE B. KAUFFMAN,
GEORGE M. BERINGER,
M. I. WILBERT.

REPORT OF DELEGATES TO SECTION PHARMACOLOGY AMERICAN MEDICAL ASSOCIATION, FIFTY-SIXTH ANNUAL SESSION, PORTLAND, OREGON, JULY 11–14, 1905.

The sessions of the association this year, despite the great distance of travel for the majority of members, was largely attended, nearly 1800 members being registered.

The time and expense involved in a trip across the continent is more than compensated for by the experience and observation of such a trip, and the opportunity to see and realize the vastness of this, the greatest country on earth.

A trip to the Pacific coast should be the aim of every American who dwells this side of the Rockies, just as a pilgrimage to this Mecca of Atlantic Coast resorts should be the perennial ambition of us all.

The attraction of the session this year centered in the Proprietary Medicine question, the issue having been squarely raised by the association—especially through its great weekly—"The Journal of the American Medical Association."

As the culmination of plans which were under consideration for the past several years, the Board of Trustees created by resolution an advisory board to be known as the Council on Pharmacy and Chemistry of the American Medical Association. The organization of the Council was perfected at Pittsburg, Pa., Feb. 11, 1905, and it herewith presents the following statement:

PRELIMINARY ANNOUNCEMENT.

It is the immediate purpose of the Council to examine into the composition and status of the various medicinal preparations that are offered to physicians, and which are not included in the United States Pharmacopœia, or in other standard text-books or formularies. These preparations will include the synthetic chemical compounds, as well as the so-called proprietaries and pharmaceutical specialties put out under trade-marked names. Preparations which conform to the standard established by the ten rules governing the matter, will be incorporated in "New and Non-Official Remedies," a book to be published by "The Journal of the American Medical Association."

The general need of an accessible, authoritative work of reference of this character is obvious, for at present there is no such book to which the physician can refer. Its value will be proportional to its completeness. It is, therefore, proposed to be as liberal in approving articles for the book as is consistent with justice and equity to the public, to the manufacturing pharmacist and chemist and to the physician. The acceptance of articles will be determined by the appended rules, an examination of which will show that they are sufficientiy liberal to permit the admission of all articles offered to the medical profession that are honestly made, ethically exploited, and worthy of patronage by intelligent physicians.

The acceptance of an article will be based on a careful and unprejudiced examination of the accessible information from all sources, and in compliance with the adopted rules. An acceptance, however, is not to be interpreted as an endorsement, neither is omission from the list to be construed, in every case, as condemning an article; it may mean that the necessary information has not been obtained. The Council does not pass judgment on the therapeutic value, but on the ethical status only. The Council does not presume

to dictate what preparations should be prescribed; nor is it the present intention to conduct an active campaign against fraudulent products; but merely *to supply necessary and desirable information concerning those which it considers unobjectionable.*

The plan for the work is briefly as follows: All available information regarding a product will be secured from the manufacturer and from other sources. This information, together with specimens of the article, will be submitted to a committee of experts, who will examine critically into the product, consider the claims made for it, and make a report. On the basis of this report, the Council will accept, reject, or hold for further consideration. If accepted, the information will be condensed and arranged somewhat on the plan of the United States Pharmacopœia, but with the addition of brief pharmacologic and therapeutic data. The Council believes that there are many articles, at present not recognized by the Pharmacopœia, which comply with the required standard and do not need any further investigation. In this class come many of the synthetics as well as many well-known pharmaceutical specialties. These are now being written up, and it is proposed to issue the first edition of the book as soon as possible. No charge will be made for representation in the book.

As fast as new articles are accepted, all information regarding them will be published in "The Journal of the American Medical Association," and will be incorporated in the next edition of the book.

The Council appreciates the importance and difficulties of the work to be undertaken and does not expect to take a step forward without being sure that it is right and just to all concerned. It does not dare to hope for perfect results and can only promise to strive earnestly, honestly and impartially to avoid serious errors of commission and omission. It asks for the hearty co-operation and assistance of those it believes to be interested in the work—the entire medical profession and all honorable manufacturing pharmacists and chemists. Criticisms and suggestions will be welcome.

RULES GOVERNING THE ADMISSION OF ARTICLES.

The following rules are adopted to guide the Council on Pharmacy and Chemistry of the American Medical Association:

(The term "article" shall mean any drug, chemical or preparation used in the treatment of disease.)

RULE 1.—No article will be admitted unless its active medicinal ingredients and the amounts of such ingredients in a given quantity of the article be furnished for publication. (Sufficient information should be supplied to permit the Council to verify the statements made regarding the article, and to determine its status from time to time.)

RULE 2.—No chemical compound will be admitted unless information be furnished regarding tests for identity, purity and strength, and, if a synthetic compound, the rational formula.

RULE 3.—No article that is advertised to the public will be admitted; but this rule will not apply to disinfectants, cosmetics, foods and mineral waters, except when advertised in an objectionable manner.

RULE 4.—No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to vaccines and antitoxins nor to advertising in medical journals, nor to literature distributed solely to physicians.)

RULE 5.—No article will be admitted or retained about which the manufacturer, or his agents, make false or misleading statements regarding the country of origin, raw material from which made, method of collection or preparation.

RULE 6.—No article will be admitted or retained about whose therapeutic value the manufacturer, or his agents, make unwarranted, exaggerated, or misleading statements.

RULE 7.—Labels on articles containing "heroic" or "poisonous" substances should show the amounts of each of such ingredients in a given quantity of the product.

RULE 8.—Every article should have a name or title indicative of its chemical composition or pharmaceutic character, in addition to its trade name, when such trade name is not sufficiently descriptive.

RULE 9.—If the name of an article is registered, or the label copyrighted, the date of registration should be furnished the Council.

RULE 10.—If the article is patented—either process or product—the number and date of such patent or

patents should be furnished. If patented in other countries, the name of each country in which patent is held should be supplied, together with the name under which the article is there registered.

ARTHUR R. CUSHNY, Ann Arbor,
C. LEWIS DIEHL, Louisville,
C. S. N. HALLBERG, Chicago,
ROBERT A. HATCHER, New York,
L. F. KEBLER, Washington,
J. H. LONG, Chicago,
F. G. NOVY, Ann Arbor,
W. A. PUCKNER, Chicago,
SAMUEL P. SADTLER, Philadelphia.
J. O. SCHLOTTERBECK, Ann Arbor,
GEO. H. SIMMONS, Chicago,
TORALD SOLLMANN, Cleveland,
JULIUS STIEGLITZ, Chicago,
M. I. WILBERT, Philadelphia,
H. W. WILEY, Washington,

Members of the Council on Pharmacy and Chemistry, Amer. Med. Association.

The work of this Council, whose majority it will be observed consists of members of the American Pharmaceutical Association, brought the subject of Proprietary Medicines prominently before the Association from many different quarters.

These expressions comprised:

A discussion in the address of the President, Dr. Lewis S. McMurtry, of Kentucky.

A paper on Proprietary Medicines by Dr. Frank Billings, Chicago.

Report of the Board of Trustees to the House of Delegates, endorsing the Council of Pharmacy and Chemistry, and the attitude to the nostrums of the Missouri State Medical Society.

The reports in the section on Pharmacology:

Proprietary Medicine—which dealt with the nomenclature.

Patent Medicines—efforts to exclude objectionable advertisement from the mails, and,

Resolutions by the section recommending:

Scientific titles for Proprietary Medicines.

Adherence to the nomenclature of the U. S. P., 8.

Changes in the postal laws and regulations so as to exclude objectionable medicines and advertisements from the U. S. mails.

There were also papers on the following subjects by members of our Association:

The Pharmacopœia of the United States of America; Its Functions. How May These be Best Presented to the Medical Profession? William M. Searby, San Francisco.

The United States Pharmacopœia: The Advance in Pharmacy Indicated in the VIIIth Decennial Revision. C. S. N. Hallberg, Chicago.

Abst.—Revision of the nomenclature. Limitations on purity and strength. Restrictions on innocuous contamination of chemical products, absolute exclusion of poisonous metals or other toxic substances as impurities in medicinal chemicals. Standardization of principles in organic products and their preparations; volatile oils, drugs containing alkaloids and other proximate principles, antidiphtheritic serum. The new synthetics: their nomenclature. The pharmacy of the internal dosage forms. External preparations. Omissions.

The Uncertain Origin of Many Vegetable Drugs and Its Bearing on Physiologic Action and Medical Practice. Albert Schneider, San Francisco.

Abst.—Due to intentional and unintentional substitution and sophistication, many vegetable drugs are more or less unreliable or wholly inert. The great majority of physicians are helpless or unable to remedy or even to detect the defect, because of a lack of the necessary educational preparation. How physicians and pharmacists may remedy the defect. Incomplete or even total absence of instruction in materia medica, pharmacology and pharmacography in many of our leading medical colleges. A citation of the vegetable drugs which are more or less inert due to the causes cited. Similarity and dissimilarity in botanic relationship and physiologic action. Insufficient knowledge of the chemistry and physiologic action of drugs. Worthless pharmaceutical preparations are made from originally good drugs. Conclusions.

From address of the President of the American Medical Association.

COUNCIL ON PHARMACY AND CHEMISTRY.

The use of proprietary medicines in the treatment of diseases has become one of the most confusing and demoralizing questions of the day. All proprietary medicines must not be classed as secret nostrums, for there are many honestly made and ethically advertised proprietary preparations that have therapeutic value and that deserve the approval of the medical profession. But there are many preparations offered the profession, which are protected by copyright or trade-mark, with formulæ more or less fictitious, and for which are made extravagant claims, which are in fact secret remedies. These preparations are so exploited by the manufacturer that the physician is persuaded to use them instead of writing a prescription; and since they usually bear popular names and plausible therapeutic claims, they appeal to the fancy of the laity. The field is an enticing one for commercial enterprise since these preparations in many instances are simple mixtures and contain the most inexpensive drugs. The use of such remedies is both unscientific and unjust, alike to physician and to patient.

The separation of the legitimate pharmaceutical preparations from the class of fraudulent nostrums described is a most difficult undertaking. This perplexing problem forced itself from year to year on the attention of the Board of Trustees in the effort of the board to keep the advertising pages of *The Journal* free from unethical advertisements. In order to have thorough protection and to make no unjust discrimination, the board has established the Council on Pharmacy and Chemistry to make the necessary investigations. The council is composed of pharmacists and chemists of national and international reputation. It will be the aim of the council to publish in book form, a list of the preparations which are not official, yet which conform to the proper ethical standard. The work of the council will be similar to that of the Committee on Revision of the United States Pharmacopœia.

The magnitude and importance of this work is such that I desire to direct attention to it here, and to commend it to the members of the Association as deserving every possible aid and advancement. It is the only practical way to deliver the profession from one of the greatest curses that ever came on it.

MISSOURI RESOLUTIONS ON SECRET NOSTRUMS.

At the last meeting of the Missouri State Medical Association, held at Excelsior Springs, Mo., April 16 to 18, this year, the following resolution was passed:

Resolved, That the three delegates of the Missouri State Medical Association to the American Medical Association be appointed a committee to prepare a resolution embodying the sentiments of a paper read by Dr. William G. Moore, of St. Louis, entitled "The Present Status of Therapeutics."

This paper dealt with the subject as its title signifies, and drew attention to the fact that many of the remedies now used in the daily practice of the vast majority of the practitioners of this country, were of the so-called proprietary kind, the exact composition of which is unknown, save to the manufacturer of the remedy; and that the practitioner thus using such a remedy lowers the dignity of his profession.

Again, the responsibility of the profession is shown in the license allowed medical journals, which are absolutely their creatures and should be under their control, to advertise these remedies, not only in their advertising pages, but also by reading notices scattered throughout their columns.

Therefore, the delegates of the Missouri State Medical Association respectfully present the following:

WHEREAS, The majority of the so-called proprietary remedies are secret nostrums whose formulæ are unknown to the medical profession; and

Whereas, The use of such remedies stifles investigation of national therapeutics and lowers the standard of our practice to mere empiricism; and

Whereas, The medical journals, the creatures of our profession, are filled with advertisements of these nostrums enlisting the attention of the unwary practitioner and resulting in enriching the manufacturer and defrauding the unsuspecting patient; therefore be it

Resolved, That it is the sense of this body that the use of these remedies by members of the American Medical Association is reprehensible and that these advertisements should not appear in reputable medical journals.

RESOLUTIONS ADOPTED BY THE HOUSE OF DELEGATES.

COUNCIL OF PHARMACY APPROVED.

The Report of the Board of Trustees on the creation of the Council of Pharmacy and Chemistry is, in the opinion of your committee, the most important and effective measure ever undertaken by this Association to rid the profession of the abuse of the nostrum evil. The personnel of the Council is of such a character as to create a feeling of confidence that the proposed work will be done thoroughly, conscientiously and justly. The publication of the results of the work of the Council in book form with annual editions will afford a source of information of inestimable value to the profession.

Therefore, we recommend that the House of Delegates indorse the action of the Board of Trustees in the creation of the Council on Pharmacy and Chemistry; that the Trustees be requested to devise a plan through which the Council may be made permanent, and that the Trustees request the Secretary of Agriculture of the U. S. Government to give the Council on Pharmacy and Chemistry recognition by authorizing the Bureau of Chemistry to co-operate with the Council in its work.

We indorse the work already performed by the Council on Pharmacy and Chemistry in the formulation of rules governing the mode of selection of articles to be investigated and the publication of results already obtained.

We recommend the publication in book form of a list of the preparations not in the Pharmacopœia, that are approved by the Council on Pharmacy and Chemistry.

We indorse the underlying sentiments of the preamble and resolutions presented by the committee of the State Medical Society of Missouri, of those presented by the Section on Practice of Medicine, and of the resolution presented by Dr. Jones, of California.

We recommend the adoption of the following motions:

Resolved, That it is reprehensible for the members of this organization to prescribe or use nostrums, and that we request the Board of Trustees not to advertise any nostrum in the columns of "The Journal."

Resolved, That we request the Board of Trustees hereafter to insert in "The Journal" with each advertisement the formulas of remedies which may have been favorably passed on by the Council of Pharmacy and Chemistry for advertisement.

Resolutions adopted by the Section of Pharmacology on Proprietary Medicines, on The Nomenclature of the U. S. Ph. 8; on Patent Medicines.

Resolved, That it is the sense of the Section on Pharmacology and Therapeutics that all proprietary products should have titles as nearly descriptive as possible of their active constituents or elementary composition; and that, while we deplore the present necessity of trade names and titles, we recognize that the evils of substitution are so prevalent that in the interests of honest progressive pharmacy the use of such names and titles can not be avoided. It is, however, the further opinion of this Section that many, if not all, of the objectionable features of proprietary products can be eliminated, first, by the use in connection with the trade name, of some subtitle which will express in scientific terms the nature and character of its composition; and second, by the use on the label or in the disseminated literature, of a descriptive formula which will exhibit the character and proportions of the active constituents.

Whereas, The U. S. Pharmacopœia has established standards of nomenclature and orthography which appeal to science and scientific methods: therefore, be it

Resolved, That the Section on Pharmacology and Therapeutics respectfully urges the desirability of the American Medical Association accepting the U. S. Pharmacopœia as the standard of nomenclature and orthography in all its transactions and publications.

Whereas, The Postmaster-General of the United States and the Secretary of Agriculture are making

laudable efforts to restrict or to exclude all obnoxious, fraudulent and dangerous substances from the United States mail; and

Whereas, These efforts are nullified to a certain extent by abstruse or incomplete laws, or misunderstanding in their interpretation; therefore, be it

Resolved, That the Section on Pharmacology and Therapeutics of the American Medical Association extend to the Postmaster-General and the Secretary of Agriculture our sincere appreciation of their efforts in behalf of honest pharmacy and assure them that this Section is in accord with their methods and objects; and be it

Resolved, That the Section on Pharmacology and Therapeutics of the American Medical Association emphasize to our legislators and post-office authorities the necessity of denying to every fraudulent and dishonest firm the use and privileges of the United States mails in every way and particular; and further be it

Resolved, That the Section on Pharmacology and Therapeutics of the American Medical Association urge on the post-office authorities the desirability of a proper regulation for the protection of the people which will make necessary the proper and plain labeling of all poisonous tablets, powders or other substances before admitting the same to the privileges of the United States mails.

It is hoped that this work will demonstrate that the American Medical Association is keenly alive to the situation, and is preparing to grapple with the nostrum traffic.

The evils that this unsystematic, unscientific, and therefore non-pharmaceutical course, as pursued by many engaged in the manufacture and exploitation of proprietary medicines "for the exclusive use of physicians," have brought on pharmacy as a practice and a profession it is unnecessary to dwell on.

While this movement is naturally in the interest of the medical profession, it cannot fail to be of equal benefit to pharmacy, and should therefore be entitled to the cordial sympathy and support, if not active co-operation, of the American Pharmaceutical Association.

Respectfully submitted, C. S. N. HALLBERG.

Chicago, Sept. 5, 1905.

Mr. W. A. Puckner, seconded by Mr. Stein, moved to accept the report and adopt the resolutions offered as expressive of the sense of this Association, and the motion prevailed.

The Secretary read the following resolution, coming from the Scientific Section with its approval:

Resolution anent the inspection of Imported Drugs referred to Committee on National and State Legislation.

WHEREAS, The American Pharmaceutical Association was organized in 1852 for the especial purpose of endeavoring to improve the quality of drugs brought to the United States through the various ports of entry. And whereas it appears that the identity and quality of many drugs of foreign origin do not conform to the requirements of pharmacy and medicine. Therefore be it resolved that this Association protests against such a condition and asks that the federal government take steps to extend and elaborate the system of custom-house inspection and also that the Congress be asked to revise the laws to conform to present methods of examination and standards in order that the American public be protected against adulterations, sophistication and substitution and importation of unclassified drugs, such as herbs, leaves and roots.

Mr. Lowe of Philadelphia, moved the adoption of the resolution as offered.

Mr. Eliel moved to amend to the effect that the resolution be adopted and turned over to the Committee on Publicity. He considered this a specially good opportunity to show the public that the American Pharma-

ceutical Association was trying to accomplish something in this direction. To the suggestion of the Chair that it would naturally go into the Bulletin and be made as public as possible, Mr. Eliel responded that it would only reach members of the Association in that way, and he thought the Committee on Publicity should give the matter the widest possible publicity through the public press of the country. Mr. Sheppard seconded this motion, and Mr. Hallberg, the author of the resolution, indicated his acceptance of this amendment. Mr. Ebert, of Chicago, moved that the resolution be also referred to the Committee on National and State Legislation, which suggestion was also agreed to by the author.

The motion to adopt as thus amended was then put and carried unanimously.

The Secretary read the report on the Committee on Procter Monument:

REPORT OF COMMITTEE ON WM. PROCTER, JR., MONUMENT.

The committee desires to report that since its appointment last year satisfactory work has been accomplished.

It must be understood that a work of such proportions cannot be best accomplished with too much haste. At the same time the committee appreciates the importance of constant effort in formulating the most reasonable and accurate plans to reach the attention of the pharmacists of America.

After careful consideration it has been deemed wise first to endeavor to popularize the movement by publishing from time to time brief articles on Prof. Procter and the work which he did in the interests of American pharmacy, and at the same time show the desirability of erecting a memorial monument to the Father of American Pharmacy at the capital of his country before calling for individual subscriptions. In other words, it seems desirable to endeavor to create a more or less universal sentiment in favor of the monument before making a concerted effort to collect the funds necessary for the purpose.

It is gratifying to report that the pharmaceutical journals have signified their willingness to coöperate with us in our efforts to popularize the movement.

The coöperation of several state pharmaceutical associations has been secured, and before the next annual meeting of this Association we expect to secure the assistance of all the state pharmaceutical associations and other allied organizations in pharmacy.

J. F. HANCOCK,
HENRY KRAEMER,
C. S. N. HALLBERG,
Committee.

Mr. Hancock, chairman of the committee, spoke on the report, and said many of the State pharmaceutical associations had been communicated with during the year,—although he had been delayed by illness in the early part of the year from pressing the matter more vigorously,—and they were very much interested in the work, and the committee felt greatly encouraged and hoped to secure the assistance of all the pharmaceutical associations in the United States during the coming year. The committee was trying to arouse a sentiment, particularly among the younger pharmacists, to know more about William Procter, Jr., and the great work he

accomplished for pharmacy. The movement was growing in popularity, and the committee had met with no obstacles at all. It would be a grand thing for the American Pharmaceutical Association when it succeeded in having these archives housed in the Smithsonian Institution and a bronze statue of William Procter, Jr., erected in the Smithsonian grounds at Washington; not only would it be a monument to Procter, but a monument to the high standing of pharmacy established by Procter and his colleagues.

Mr. Ebert directed particular attention to the fact that the correct name was William Procter, Jr.—Procter spelled with an *e* and not with an *o*. He thought it desirable to preserve the correct orthography, just as originally written by Procter himself, especially in view of the fact that there was a Proctor prominent in British pharmacy.

Mr. Anderson, of Brooklyn, moved to adopt the report of the committee, and the motion was seconded by Mr. Roehrig, and carried.

The Secretary next read the report of the Committee on Local Organizations of Branches of the A. Ph. A.:

REPORT OF COMMITTEE ON LOCAL A. PH. A. ORGANIZATIONS.

To the Officers and Members of the A. Ph. A.:

Your committee recommends that a scheme of local A. Ph. A. organizations be started by authorizing the colleges and schools belonging to the American Conference of Pharmaceutical Faculties to act as local branches. Said colleges to disseminate a knowledge of the purpose and achievements of the A. Ph. A. among the students, faculties and members, solicit new members and in any legitimate way further the interests of the A. Ph. A.

We further recommend that the above-named colleges be invited to submit to the A. Ph. A. a report on the condition of pharmacy in their respective sections of the country and make suggestions for the advancement of the A. Ph. A.

In order to establish the above plan, we recommend that the President in appointing the general committee on Membership and Reception shall name an assistant chairman "on Colleges of Pharmacy and Local Organizations."

Respectfully submitted, H. M. WHELPLEY, *Chairman*,
C. S. N. HALLBERG.

Mr. Payne, of Georgia, moved to amend to include all reputable colleges of pharmacy—colleges recognized by their state governments. There was no second to this motion, and a vote was not taken on it.

On motion of Mr. Hynson, the report was then adopted.

The Secretary read the report of the Committee on Weights and Measures:

REPORT OF SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

To the President and Members of the American Pharmaceutical Association:

Gentlemen: The Special Committee on Weights and Measures, appointed by the President, desires to report that no legislation has been enacted by Congress during the past year affecting the subject of the adoption of the Metric System.

One of the difficulties in using the Metric System for dispensing has been the lack of an officially-recognized subdivision of the litre smaller than the one-thousandth part.

The International Committee on Weights and Measures (see the Pharmaceutical Journal, July 1, 1905) has approved the use of the terms mil, decimil, centimil, as representing the fuller meanings, millilitre (mil), or cubic centimetre, one-tenth part of a millilitre (decimil), one-hundredth part of a millilitre (centimil).

It would seem desirable for this Association to recognize these terms and the chairman of your committee would recommend that a resolution to that effect be approved.

Respectfully submitted, F. G. RYAN, *Chairman.*

Mr. Sheppard moved that the report be received and that the recommendations be adopted.

Mr. Hallberg expressed the opinion, as one of the members of the committee, that the Association was not quite ready to take this subject up and act on it, and moved a reference of the report, with its recommendations, to the Section on Scientific Papers. Thereupon, Mr. Sheppard withdrew his motion, and the motion of Mr. Hallberg, which was seconded by Mr. Eliel, was adopted.

Mr. Lohmann thought it was all right to refer the matter to the Scientific Section, but thought it should also be referred to the Conference of Pharmaceutical Faculties. It was difficult for young people to understand this system, and it would be much easier comprehended if their attention was directed to it by their instructors in the colleges. Mr. Hallberg said that would naturally follow, and the Secretary reminded the speaker that the Conference of Faculties was now a part of this body, and it would go there anyhow.

The Secretary read in abstract the report of the Committee on Transportation, the full text of the report being as follows:

REPORT OF THE COMMITTEE ON TRANSPORTATION.

Mr. President and Members of the American Pharmaceutical Association:

Your Committee on Transportation beg leave to report that application was made early in June of the present year to the Trunk Line Association for reduced rates on account of the fifty-third annual meeting, and a rate of one and a third fare for the round trip, on the certificate plan, was promptly granted. This arrangement was subsequently concurred in by the Western Passenger Association, the Southwestern Excursion Bureau, the Central Passenger Association, the New England Passenger Association and the Southeastern Passenger Association. The charge of twenty-five cents by the railroads to individual holders of certificates for validation of the same, still continues in force. It has been agreed that the special agent of the Trunk Line Association shall be in attendance at the meeting on Thursday and Friday, September 7th and 8th, from 9 a. m. to 6 p. m., for the purpose of validating all certificates presented.

The Western Passenger Association and the Southwestern Excursion Bureau declined to extend the life of their certificates beyond September 14th, as their rules forbid longer extension when meetings are held outside of their territory, whereas return tickets on lines of the other four associations are good to leave Atlantic City as late as September 20th. A circular of information regarding transportation was sent to all members on July 5th.

For the Committee, CHAS. CASPARI, JR., *Chairman.*

Baltimore, July 15, 1905.

On motion of Mr. Anderson, seconded by Mr. Lowe, the report was adopted.

The Secretary stated that the next order of business was the report of Delegates to the National Wholesale Druggists' Association, at the New Orleans meeting of the Association in 1904. The following is the text of the report:

To the Officers and Members of the American Pharmaceutical Association:

Gentlemen: Your committee appointed by the President to represent the American Pharmaceutical Association at the convention of the N. W. D. A., held in New Orleans, in November, 1904, beg leave to submit the following report:

Your committee presented an address asking an endorsement of the American Pharmaceutical Association, and a pledge from the N. W. D. A. that they would through the medium of their traveling men, assist in building up our membership.

The address was received, responded to by Mr. Cook, and referred for action to the Board of Control.

Report of Board of Control was: "The Board endorses the suggestion of the American Pharmaceutical Association that efforts be made through the traveling salesmen of the various houses to increase the membership of the American Pharmaceutical Association, and respectfully recommends to our members their coöperation to this end."

Respectfully submitted,

F. C. GODBOLD, *Chairman*,
CASWELL A. MAYO,
P. C. CANDIDUS.

Mr. Mayo moved to receive and refer to the Committee on Publication, and Mr. Eliel seconded the motion, and it carried.

Mr. Payne, chairman, read in abstract the report of the Committee on Status of Pharmacists in Government Employ.

REPORT OF THE COMMITTEE ON THE STATUS OF PHARMACISTS IN THE SERVICE OF THE U. S. GOVERNMENT.

During the past year your committee has been active in pushing the work of securing proper recognition for pharmacists in our public service. A bill was introduced during the past year in both the House of Representatives and in the Senate; as No. 12646 in the House of Representatives, by Mr. Roberts, and as No. 3984 in the Senate by Mr. Gallinger. The wording of the bill was as follows:

A BILL

TO REORGANIZE AND INCREASE THE EFFICIENCY OF THE HOSPITAL CORPS OF THE NAVY OF THE UNITED STATES AND TO DEFINE ITS DUTIES AND REGULATE ITS PAY.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the Hospital Corps of the United States Navy shall consist of chief pharmacists, pharmacists, hospital stewards, baymen (first-class), baymen, and hospital apprentices.

SEC. 2. That the number of chief pharmacists and pharmacists on the active list shall not exceed fifty in all, the pharmacists to be appointed by the President and have the status of warrant officers: *Provided*, That the provisions of law regulating the promotion, pay and allowances, and rights of warrant officers set forth in section twelve of the Act entitled "An Act to reorganize and increase the efficiency of the personnel of the Navy and Marine Corps of the United States," approved March third, eighteen hundred and ninety-nine, shall extend to and include all pharmacists of the Hospital Corps: *And provided further*, That vacancies in the grade of pharmacists shall be filled from men holding the rating of hospital steward, subject to such examination as may be prescribed by the Secretary of the Navy; and that no pharmacist shall be promoted to the rank of chief pharmacist until he shall have passed an examination as to his mental, moral, physical, and professional qualifications before a board of officers, in accordance with regulations prescribed by the Secretary of the Navy.

SEC. 3. That the Secretary of the Navy is hereby empowered to enlist, or cause to be enlisted, as many hospital stewards, baymen (first-class), baymen, and hospital apprentices as in his judgment may be necessary, and to limit or fix the number, and to make such regulations as may be required for their enlistment and government. Enlisted men of the Navy and Marine Corps shall be eligible for transfer to the Hospital Corps.

SEC. 4. That all necessary hospital and ambulance service at naval hospitals, naval stations, navy-yards, and marine barracks, and on vessels of the Navy and Fish Commission, shall be performed by the members of said corps, and the corps shall be permanently attached to the Medical Department of the Navy, and shall be included in the effective strength of the Navy, and be counted as a part of the enlisted force provided by law, and be subject to the laws and regulations for the government of the Navy.

SEC. 5. That the pay of hospital stewards shall be seventy dollars per month; of baymen (first-class), forty dollars per month during their first five years of service and fifty dollars per month thereafter; of baymen, thirty dollars per month, and of hospital apprentices, twenty dollars per month, with such increase on account of length of service as is now or may hereafter be allowed by or in pursuance of law to other enlisted men of the Navy: *Provided*, That all benefits given by or in pursuance of existing laws, or that shall hereafter be allowed by or in pursuance of law to other warrant officers or enlisted men of the Navy, shall hereafter be allowed in the same manner to warrant officers and enlisted men in the Hospital Corps of the Navy.

SEC. 6. That all Acts or parts of Acts so far as they conflict with the provisions of this Act are hereby repealed.

The House Naval Committee agreed to vote favorably on this bill, and to report it to the House with a recommendation for its passage. Dr. P. M. Rixey, the Surgeon-General of the Navy went before the House Committee on January 18th and spoke strongly in favor of this bill, and made a powerful argument for its immediate passage. For some cause the final passage of the bill was delayed. It was found necessary to make some slight changes in the bill to meet present conditions, and this brief delay has been claimed to be the reason that the bill did not finally become a law. We are inclined to think, however, that this slight delay might have been readily overcome, but there was considerable objection to passing any new bill which increased the number of bills involving the expenditure of money. While the amount involved in the bill was small, it was still a bill of this character and counted as one bill of this kind, and as there was likely to be a deficit in the revenues, it is more than likely that this is one reason that the bill did not finally pass. There was strong support for the bill, and we think the disposition was to simply put off its passage until the meeting of the next Congress, for the reasons above stated. We have every encouragement in regard to the passage of such legislation as is embodied in the bill above mentioned. This bill gives the rank of ensign to the pharmacists of the United States Navy, and makes them commissioned officers, giving them all the privileges of other warrant officers.

In the Army we have had some correspondence with Surgeon-General R. M. O'Reilly and others under him in regard to the status of pharmaceutical work in that branch of the public service. We have received very little encouragement from the Army. The Surgeon-General persists in the position that there is very little pharmaceutical service required of the present hospital stewards, and that their pharmaceutical work consists largely of counting out tablets and pouring out ready-made preparations. There is a continual effort to advance the status of the medical officers in the U. S. Army, but it does not seem to be worth while to the powers that be in the medical department to include the advancement of the hospital stewards. The department does not seem to view with favor the introduction of a grade above the hospital stewards to be called "pharmacists." The pharmaceutical work in the U. S. Army is now done by enlisted men who are taught by the medical officers. While the regulations require a very considerable knowledge of pharmacy of the hospital stewards as shown by their published examinations and requirements, the chief of the department seems to think that very little knowledge of pharmacy is actually required, as shown in his several letters written to us at different times. *The Pharmacist of to-day is not the doctor's cook, as he used to be called, but the chemist of the modern physician.*

Ready-made preparations and formulas which are thought out and gotten up by the manufacturing pharmacists in such an efficient manner, certainly reflect much credit upon those manufacturers. It does not seem, however, that the medical officers of the Army are keeping up with modern progress if they depend altogether upon ready-made preparations which require no knowledge of pharmacy to dispense. Such ready-made preparations are usually published without any working formula whatever, but simply a general intimation to the physician as to what is in them, and in some cases these intimations are not correct, if we are to believe statements which are made by parties who appear to be in a position to know. The recent wonderful success of the medical service and pharmaceutical forces of the Japanese army has surprised the world. Their pharmacists rank as second lieutenants, and get good salaries when compared with that of their physicians of the same rank in the service. We sincerely trust that our own medical service is not fossilized, as appears to be the case. There is now considerable agitation taking place in England in favor of employing contract physicians as medical officers in their army service, the claim being made that the medical officers are fossilized and behind the times, and are not in proper touch with modern methods.

The progressive methods of the Navy and the Public Health and Marine Hospital Service are creating much interest and appreciation in the minds of the public. The Army people seem to be slow to recognize modern conditions, and while claiming that the physician knows all that is to be known about pharmacy, and can teach enlisted men all that is needed of pharmacy in the army, they are depending more and more upon the ready-made prescriptions gotten up and pushed with so much energy and ability by manufacturing pharmacists. The lamentable results of the work of the medical service of the army in our recent campaign in the war with Spain, when compared with the results among the Japanese armies in their present campaign against Russia, certainly indicate that improvements might be made in handling and in the use of medical supplies. We believe that the resistance of the army people to having a proper grade of pharmacists in this branch of the public service is sincere, as they do not realize that pharmacy and pharmaceutical chemistry is a class of work which is not thoroughly understood by the medical officers, and they have the common failing of so many medical men in thinking that when they have completed a medical course they have in some mysterious way also learned all there is of pharmacy and pharmaceutical chemistry at the same time, and are proper persons to teach the same. We have tried to show them their mistake in this regard, but we really think they do not honestly understand our position. Every other civilized country recognizes its pharmacists by giving them commissions in the army (with one exception), which is good evidence of the wisdom of our contention for pharmacists in our army service. The present Surgeon-General says we have no pharmacists in our public service, and very little pharmaceutical work is required of the hospital steward. The only country besides the United States which does not recognize its pharmacists with commissions in its army is that of Great Britain, and the management of its pharmaceutical and medical work in the recent campaigns in the Boer war show that neither branch was handled in the most efficient and up-to-date manner, if we are to judge from the terrible death-rates from sickness. To get the best class of men in any service requires proper recognition in rank and pay. As long as our medical service in the army, however, does not claim to even have pharmacists, and that the character of the work of the medical officers is such that very little pharmaceutical knowledge is required of the enlisted medical men who do the same, we certainly have but little right to expect the best results.

The up-to-date methods of the Navy and the Public Health and Marine Hospital Service are showing fine results. The excellent work of the Public Health and Marine Hospital Service which is now going on is resulting in the control of the yellow fever situation, and will no doubt prevent its spread to our other large cities. A great num-

ber of lives have been saved, and the destruction of large property values throughout the country have been prevented.

While much has been accomplished by our committee, there is yet much to be done. There are matters which need adjustment in the Public Health and Marine Hospital Service and in the Navy, and there is needed a further educational campaign in behalf of the Army hospital steward.

Respectfully submitted, GEORGE F. PAYNE, *Chairman.*

On motion of Mr. Mayo, seconded by Mr. Lohmann, the report was adopted and referred.

In this connection, the Chair stated that a representative of one of the government departments was present now who was not present at the first session, when the delegates from the various branches of the government service were called on. He referred to Mr. Lyman F. Kebler, Chief of the Drug Laboratory, Bureau of Chemistry, in the Department of Agriculture, who was now invited to address the Association.

Mr. Kebler then presented in abstract the following paper, which was listened to with much interest.

THE ORGANIZATION AND WORKING OF THE DRUG LABORATORY.

L. F. KEBLER, CHIEF.

The Drug Laboratory, which is an integral part of the Bureau of Chemistry, U. S. Department of Agriculture, has been in active operation for a little over two years, and in view of the fact that this Association has taken so much interest in its establishment and progress, and encouraged it in so many ways, it seems but right and proper to give an account of its entrusted work at this time.

By an act of Congress approved June 30, 1902, the Secretary of Agriculture was authorized to investigate the adulteration of drugs in the United States. Among the chief reasons why the Drug Laboratory was delegated to the U. S. Department of Agriculture were undoubtedly the following: First, because a large number of drugs of known utility are derived from the farms, gardens and forests of this country, and these interests are all centered in the Department of Agriculture. Second, because most of the work connected with the adulteration of drugs is of a chemical character, for which a bureau is established in this Department. Agricultural industries interested in the production of drugs are seriously retarded, hindered and threatened by the importation into this country of adulterated and inferior goods, which diminish legitimate profits and tend to destroy interest in the production of these commodities.

Under the act mentioned above, the Secretary of Agriculture took steps to establish the Drug Laboratory. The Civil Service Commission held an examination for the purpose of establishing an eligible list from which appointments could be made to fill the various positions created in this laboratory. From this list a chief was appointed, who assumed active charge

March 1, 1903. The demands on the laboratory have been very great, and the personnel of its working force has been increased until there is at present a chief, three assistant chemists, and a stenographer and typewriter. In addition to this we have the co-operation of the various laboratories organized in the Bureau of Chemistry for the purpose of prosecuting certain lines of investigations. For example, one laboratory is devoted exclusively to the determination of nitrogen; when technical reasons do not prevent doing so, this laboratory makes all nitrogen determinations for the Drug Laboratory, and in all events makes checks. On the same basis all sugar determinations are made by the Sugar Laboratory. Under these conditions the actual available working force of the Drug Laboratory is much greater than indicated above. The work of the laboratory is also much facilitated by the arrangement which obtains in the Department of Agriculture relative to the workings of the library. For example, the current numbers of periodicals that are of interest to the Drug Laboratory are brought to this laboratory for reading and review. The librarian of the Bureau also secures all books of reference that are needed for consultation, reading and verification. This feature alone is very time-saving and valuable.

The work now in progress in the laboratory reaches out in many directions, some of which will be enumerated below.

CHEMICAL REAGENTS.

When active duties were assumed in this laboratory, the examination of chemical reagents was delegated to it. The objects of these examinations were; First, to insure reliable chemicals for analytical work; second, to secure data from which standards of purity can be constructed, and, last, to place competitors on an equal footing. The qualities usually specified in placing orders and letting contracts are the best grades of the several respective types. Some very interesting examples have been met with, but it is encouraging to note that the number of inferior and mislabelled goods received during the past year is less than when this work was first instituted. For example, when an article is purchased that is to comply with the regulations of the Pharmacopœia, the vendor does at times either mark it as of the quality requested, or leave it unlabelled entirely, and it frequently happens that these goods do not comply with the standards set. There are now available in the Drug Laboratory the data of about 700 analyses of chemicals, and a bulletin is in preparation giving these results, and setting forth the standards under which these goods were accepted or rejected.

PLANT DRUGS.

This is one of the most interesting lines of work connected with this laboratory. It involves a systematic study and improvement of the analytical methods at present available. The general principles to be followed

are similar to those that have been utilized by the Association of Official Agricultural Chemists for many years. It also includes a study of the influence of time on the active constituents contained in many potent plants. At the twenty-first annual meeting of the Association of Official Agricultural Chemists the first report was presented by the referee, appointed a year previous, on plants and drugs, giving the results of co-operative work, which was confined to the methods of opium assay.

COD-LIVER OIL INVESTIGATIONS.

It is a well-known fact that physicians consider Norwegian cod-liver oil superior to the American cod-liver oil, and so far as we can judge there does not appear to be a good reason for this discrimination. Such a discrimination places an important American industry in a very disadvantageous position. The object of this investigation is to determine by comparative study of American and Norwegian cod-liver oils, chemically, medicinally and commercially, whether there is any good reason for this preference, and if so what it is, and how it could be remedied. In order to make the investigation as complete as possible, the chief of the Drug Laboratory secured the assistance of the Division of Foods of the Bureau of Chemistry, and the Bureau of Fisheries was asked to co-operate in this undertaking, with the result that those in charge expressed an earnest willingness to assist us in every possible way, guaranteeing to provide us with oils of authentic quality. This work has been carried out to a certain extent, and we have now in possession at the Bureau of Chemistry a large number of oils with full histories as to the method of manufacture, the condition of the fish from which the oils were taken, and the locality in which the fish were caught. The Fish Commission is also making a study of the methods of preparing the oils commercially, both in Norway and in this country. The results obtained by us so far tend to show that the American cod-liver oils are equal to the Norwegian oils in every respect chemically. This line of work will be prosecuted during the coming year, and a large number of samples of authentic purity will be secured, and these will be compared with the commercial articles generally available.

PROPRIETARY MEDICINAL AGENTS.

By authority of Congress any department of the government may secure the service of the Bureau of Chemistry by making application to the Secretary of Agriculture for assistance. It is under this authorization that the Drug Laboratory was requested to assist the Post-office Department by analyses and other means in arriving at fair and just conclusions relative to the fraudulent and dangerous nature of certain products that are enjoying the privileges of the mail. The fraudulent representations and impossible cures set forth by many of these remedies are certainly interesting.

Claim Originality.—Some base their claims on originality. For ex-

ample, one concern set forth in its advertising literature that they were the originators of hyoscine hydrogenbromide (hyoscine hydrobromide) and were the first to introduce it in medicine. This company was organized nearly twenty years after hyoscine had been thoroughly studied and recognized as a medicinal agent of great value. Another firm dealt in a commodity which it called by the name of "Paris Food." This remedy resembled closely the ordinary cold cream of the Pharmacopoeia and was a good product, but the claims made for it were highly extravagant. The company stated in its literature that this remedy was largely used by European physicians and was doing marvelous things. On investigation it was found that this remedy had never been used by any physician in Europe, except possibly by representatives of the firm itself. Another general principle taken advantage of by these firms is that the remedies they are using are *rare* and *expensive*, when as a matter of fact they are usually among the most ordinary, well-known medicinal agents.

Novel Method of Application.—This has been claimed by a number of firms that are at present no longer doing business. One claim was that they were the originators of what is commonly known in medicine as bougies. On investigation it was found that the use of the bougies antedated the existence of the company by at least a score of years. This same company also claimed by literature and cuts to deliver to the prospective patient agents that had been electrified. Such a product (bougie) was believed to be impossible of production and, at the hearing, the physician in charge admitted that nothing of this kind was done, neither was it possible in general but he stated that this electrifying may mean something similar to what is generally meant when a speaker is spoken of as electrifying his audience. We hardly believe that an electrification of this character could have any very great medicinal virtue.

Coined Names.—A common practice followed by a number of firms dealing in goods of this character is to advertise a prescription which is heralded as being efficacious in the cure of many diseases and in this prescription will be found a number of coined or absolutely ambiguous names which cannot be found in ordinary medical and pharmaceutical literature available in the best regulated drug-stores. The prospective patient on taking this prescription to the drug store to have the same filled is usually informed that certain drugs cannot be supplied. The advertisement connected with this prescription usually anticipates this and makes provision by informing the patient that if he is unable to secure the ingredients called for in this prescription at his local drug-store the advertising firm will be pleased to comply with his request on forwarding the prescription and price. The price charged is usually exorbitant.

Radium Fraud.—Since the discovery of radium a number of cures have apparently been effected by its use. This fact, coupled with the popular interest aroused in radium, has been taken advantage of by a number of

firms to the disadvantage of many patients. A number of these products have been examined and not a single one has been found to contain a trace of radium. One consisted of a pyrophosphorescent ore, composed of sulphides of lead and zinc.

Standard Remedies but Exaggerated and Fraudulent Claims.—Many of these firms use some of the well-known ethical combinations of standard drugs commonly employed by all physicians in their practice and nothing could be urged against the use of these remedies, if it were not for the fact that these people through these remedies claim to do marvelous things bordering on the miraculous. For example, one firm with a very good remedy stated that there was nothing that their remedy would not cure Such a statement as this is known by any one, who has the remotest knowledge of medicines, to be false. Many ridiculous claims of a similar character are met with.

Some Marvelous Remedies.—The post-office department asked for the investigation of certain remedies which through their advertising literature were heralded as being capable of curing all ills that human flesh is heir to, especially lost manhood, lost vitality, the production of fine complexions, and turning a black skin white by means of complexion powders, tablets and lotions; removing wrinkles and taking kinks out of hair. One of the lost vitality restorers consisted of flavored vaseline. One of the complexion lotions consisted of a solution of corrosive sublimate mixed with tincture of benzoin and glycerin. A complexion powder was ordinary Rochelle salt.

In this connection it might be desirable to call attention to another practice common with the firms dealing in goods of the above character. As an example may be cited the case of a prospective patient who was sent an envelope on which it was stated that it contained medicated papers and that when these medicated papers were dipped in the urine of the patient and forwarded to the office of the sender these papers would be analyzed microscopically and chemically and the nature of the diseases with which the patient was suffering would be diagnosed. The envelope contained only a single slip of litmus paper. Such a procedure we know is false in every detail because there is no chemist or microscopist who could under these conditions give any information relative to the nature of a disease from which the patient may be suffering.

DRUG LEGISLATION.

For the past year numerous requests have come from legislative bodies all over the United States relative to present existing laws regulating the adulteration of drugs and the proper labeling of the same. It was therefore considered expedient to collect into bulletin form all federal and state laws bearing on this subject so that these inquiries could be fully and completely answered in the shortest possible time. It is hoped that this bulletin will be available by the first of next year.

AUTHORITY TO EXAMINE SAMPLES.

Numerous requests come to the Bureau of Chemistry asking that investigations be made of certain medicinal remedies. In general the Bureau of Chemistry is unable to make such examinations, especially when they are of value only to an individual or a small group of individuals. On the other hand, such investigations may be taken up for the general public welfare. The Drug Laboratory is authorized by the Secretary of Agriculture to co-operate with the American Pharmaceutical Association and the American Medical Association.

The Chair expressed the pleasure the Association had had in hearing from Mr. Kebler, but regretted that he could not have been present at the first session, when the attendance was larger.

The Chair named the following Committee on Time and Place of Next Meeting: Messrs. C. B. Lowe, of Philadelphia, Pa.; H. M. Whelpley, of St. Louis, Mo.; E. G. Eberle, of Dallas, Texas; C. M. Ford, of Denver, Colo.; and Henry Canning, of Boston, Mass.

The Chair also named the following as delegates from this Association to the meeting of the National Wholesale Druggists' Association: Messrs. Charles Holzhauer, of Newark; W. C. Wescott, of Atlantic City; W. C. Alpers, of New York; C. A. Mayo, of New York, and Ralph B. Gable, of New York.

As Delegates to the meeting of the National Association of Retail Druggists in Boston this month (September), the Chair named the following: Messrs. William C. Anderson, of Brooklyn; Elie H. LaPierre, of Boston; S. A. D. Sheppard, of Boston; William E. Lee, of Philadelphia, and M. G. Tielke, of Cleveland.

Mr. Payne, of Georgia, said he thought the thanks of the Association were due to Surgeon-General Wyman, of the Public Health and Marine Hospital Service, for a most excellent pamphlet he had had gotten up by Drs. Motter and Hunt, in the nature of a *resumé* of the United States Pharmacopœia. Mr. Mayo said he would like to have added to that the thanks of the Association for the exhibit made at Atlantic City. Mr. Kremers said the Sheppard resolution passed at this session covered these points—the work done at Washington, the papers presented before the Scientific Section, and the exhibit made at the Atlantic City meeting. Mr. Payne was inclined to insist on his motion, but at the suggestion of the Secretary that it might look a little odd to send in two resolutions, he did not press the matter.

Mr. Anderson, of Brooklyn, moved a rising vote of thanks to the local committee for its lively interest in the meeting and the entertainment features provided for the members, and especially to Mr. Wescott, Local Secretary, who had been most active in his efforts to see that the Association collectively and the members individually did not want for anything; also to the committee of local ladies, who had done so much for the pleasure of the visiting ladies; to the hotel people, who had been very

kind and accommodating, and to the exhibitors, who had added materially to the interest of the meeting. Mr. Anderson said he might include in that resolution the discoverer of the oil of citronella and the manufacturers of mosquito netting, but it was hardly necessary. (Laughter.)

The motion was seconded by Mr. Hancock and Mr. Stein, and carried by a unanimous rising vote.

The Secretary then read the following resolution coming from the Commercial Section, and moved that it be referred to the Council for action, where it could be considered along with a resolution from the Scientific Section, asking for an additional session. It was so ordered.

By Mr. Hynson:

Resolved, That this Section requests the Association to provide, as a trial, for the next meeting of this Association two sessions for this Section, to be held at the same time as are held two sessions of the Scientific Section, and that two stenographers be engaged for those sessions.

The Secretary announced that this finished all the business he had in his hands.

The Chair then called for miscellaneous business.

Mr. Payne moved a standing vote of thanks to the retiring officers of the Association for their faithful work during the past year, and the motion was seconded by Mr. Mayo and Mr. Hancock, and carried unanimously.

The Chair asked if there was any further business to come before the Association, but none was brought up.

Thereupon the Chair declared the Fifty-third Annual Meeting of the American Pharmaceutical Association at an end, and the Association to be adjourned to the first Monday in September, 1906, at the city of Indianapolis.

MINUTES

OF THE

SECTION ON HISTORICAL PHARMACY.

TUESDAY EVENING, SEPTEMBER 5, 1905.

The Section was called to order at 8:30 p. m. by Chairman A. E. Ebert, of Chicago, who proceeded to read his address:

Fellow Members: In opening this, the first session of the Historical Section, let me extend to you a most hearty greeting and welcome. The sentiment which led to the establishment of this Section for recalling and recording the past of pharmacy in this country has taken definite form. The incentive for this is largely due to the semi-centennial meeting of the American Pharmaceutical Association held at Philadelphia in 1902, where the scholarly paper on the Development of American Pharmacy, by the late Dr. Frederick Hoffmann, and other papers presented at the Golden Jubilee Session, with the historical review of the work of this Association by President Whelpley in his address, and the historical exhibit, all contributed in developing a desire on the part of this Association that this historical feature should be continued.

Accordingly, as an experiment, a historical committee was appointed, of which Dr. Edward Kremers was chairman. You know how interesting were the reports of this committee at the Mackinac Island and Kansas City meetings, so that the Association decided that this feature was worthy of a permanent place in this organization. The Historical Section was therefore instituted, with Dr. Kremers as the historian.

DUTIES OF OFFICERS OF THE SECTION.

The Chairman has given much thought as to what are the duties of the members of this committee aside from those of the historian himself. Not having a precedent by which to guide him, he suggested that the duties of the Chairman of this Section should be executive and perhaps advisory in character. The work outlined for this Section contemplates a unified whole, consistent and balanced in all its parts, and must therefore be in charge of the historian himself, the only permanent officer of the Section. To make the Chairman responsible for the conduct of the work in other than a purely executive and advisory capacity, would involve the disturbance of that logical unity and sequence which are essential to the final success of the work, since the Chairman and Secretary of the Section are changed every year.

I would therefore recommend that the Chairman confine himself to presiding at the sessions of the Section, and that his address be mainly a review of the work of the Section during the year in the briefest form possible, an accounting of the funds spent and received, and such suggestions as he may deem expedient for the carrying out of the work for the coming year. There will be more details of expense connected with the

work of this section than with that of any other, perhaps, and while the aggregate may not be larger, the multiplicity of them will embarrass anyone who may have his mind upon the successful results of the work. Therefore the Historian should be relieved of all this and the Chairman be made the responsible head of the Section to authorize all disbursements. The Chairman, too, should recommend in his annual address what sum shall be advisable to be set aside by the Association for the prosecution of the work during the ensuing year. His address should be confined to matters of this character.

The duties of the Secretary should be to record the minutes of all meetings in a suitable record book, keep the accounts of the Section, draw all necessary vouchers, which should be signed by him and countersigned by the Chairman, and perform such other work as shall logically fall to the affairs of his office.

All other work pertaining to the Section, such as the collection of manuscripts, their preparation and arrangement, securing valuable papers, collections, prints, pictures, photographs, etc., and the keeping of the same in some safe place, should fall to the Historian. He also should direct what papers shall be presented to the Section, and should edit, and select or reject whatever may be presented to the Section pertaining to the history of pharmacy. His annual report should embody a review of the work for the year, and he should make such extracts of valuable papers as he may deem necessary to be read at the annual meeting and printed in the Proceedings. In other words, his judgment should be supreme in his Section insofar as all matters of historical interest may be concerned, but infringing in no wise upon the present powers of the Committee on Publication.

To assist the Historian in his work the Historical Section of the American Pharmaceutical Association should be a member of the American Historical Association and of the American Geographical Association, the annual dues of which are nominal and whose publications are extensive and valuable to this Section.

SCOPE OF THE WORK.

In inaugurating the work of the Section, warning should be given that the scope of the work is larger than that of any other Section and that the work can be made to involve a greater expense. Too much, therefore, should not be attempted at the outset. It will suffice if, at the end of a year or two, a consistent and sufficient plan for carrying on the work shall have been devised and a reasonable progress be shown in the collection and assimilation of historical data.

CONCLUSION.

The American Pharmaceutical Association is fortunate in having chosen as Historian such an able man as Dr. Kremers, who is, beyond doubt, without a peer in this peculiar province. For this reason, if for no other, your Chairman has recommended that he be made supreme in the essential work of the Section and be relieved of all details which might embarrass him in its prosecution.

The reports of the Chairman and Secretary of the Section should never duplicate those of the Historian in any particular, nor should their duties ever conflict.

Thanking you for the honor conferred by the Chairmanship of this Section, I beg leave to submit the foregoing report.

Respectfully submitted, ALBERT E. EBERT, *Chairman.*

Secretary Mayo called for action on the Chairman's Address, and directed attention to the recommendations made.

Mr. Brundage, of Brooklyn, moved that the address be received and the recommendations be taken up *seriatim*, and the motion was seconded by Mr. Whelpley and carried.

Mr. Mayo stated the effect of the first recommendation, that the duties of the Chairman and Secretary be purely executive and advisory, leaving to the Historian the collection and arrangement of historical matter.

Mr. Brundage moved to adopt, and Chairman Ebert called on Historian Kremers for an expression of his views upon the subject.

Mr. Kremers spoke at some length in stating his position as to what should be the duties of the Chairman and Secretary in their relation to the Historian. When the Historical Committee was converted into the Historical Section, it had been his hope that the duties of the officers of the Section would correspond to those of the officers of other Sections. The present Historian had planned, in addition to the collection of material, ultimately to work out a bibliography of pharmaceutical history; it was not so much his desire to write history as to collect documents and historic material for the future Historian, and he would have his hands full if he accomplished this much. Another aspect which should be borne in mind would be the proneness of any Historian, whoever he might be, to ride hobbies, and it would be a misfortune for the ideas of one man to prevail in the work of the Section. New ideas should be injected into the activities of the Section each year, if possible, and if there should be elected as Chairman and Secretary men deeply interested in the history of pharmacy, in the course of the years the members would have an opportunity of listening to a series of addresses on particular phases of pharmaceutical history which ought to prove of great value. For instance, the present officers had decided to take up the subject of pharmacy during the Civil War, and, while the contributions had not been as numerous as could have been desired, there had been several interesting papers on this subject contributed, and that field might be further developed. Next year, another subject might be taken up with greater success. The Section would thus have the benefit on the one hand of the continuous work of the Historian, and on the other of the new ideas advanced by its changing executive officers. For these reasons and others, he did not think the officers of the Section should be mere figureheads, but should be men actively interested in the work of the Section.

Chairman Ebert responded that one idea he had in mind in making his recommendation was the avoidance of long addresses from the Chairman and Secretary, involving much repetition and the great expense of publication in the Proceedings; he thought the Section should not be made too expensive to the Association. Of course, in their private capacity these officers might bring in any papers they choose, bearing upon historic pharmacy. The Historian, in his judgment, should be the supreme officer of the Section—although in Mr. Kremers' case he evidently had no desire to be supreme: in fact, Mr. Kremers had declared to him that he (Mr. Kremers) was "too much of a democrat," while the Chairman was "too much of an autocrat." He was sorry they could not agree on what the scope of the duties of the executive officers should be.

Mr. Hancock said he thought perhaps the right thing to do would be to harmonize the differences between the "autocrat" and "democrat," so that the work could be conducted with unity. He was opposed to a division of the work along the lines suggested by the Chairman, and did not believe the Chairman and Secretary should be merely executive officers. The Secretary should have a voice with the Historian and the Historian with the Chairman, and by consultation and interchange of views they would do better work for the Section.

Secretary Mayo said he desired to call attention to one point that Mr. Kremers had not brought out here as he did in the committee, and that was, by not having the duties of the Chairman and Secretary so sharply defined, the Historian would be relieved in a large measure of the responsibility of creating enthusiasm among the members in this work. If these officers were active in the affairs of the Section, it would insure their greater interest and cause them to work up enthusiasm and have presented before the Section new and different phases of the subject of pharmaceutical history.

Secretary Mayo then put the vote, *viva voce*, on the motion to adopt the Chairman's recommendation, and it was apparently lost. A division was called for, and the Secretary asked all those who favored limiting the duties of the Chairman and Secretary to a merely executive and advisory capacity to stand up. The result shows fifteen votes in favor of the proposition. The Secretary then asked those who were in favor of the Chairman and Secretary performing the usual functions of such officers in other Sections to stand, and the count showed twelve votes favoring this counter proposition. The Secretary thereupon declared the recommendation of the Chairman adopted.

The Secretary stated the effect of the second recommendation, that the Section become a member of the American Geographic and American Historical Societies, which, he stated, involved an expenditure, and therefore all this Section could do would be to recommend to the Association in general session.

Chairman Ebert briefly outlined the advantages of membership in the last-named society, whose publications, under the auspices of the Government, were very numerous, and their annual reports very expensive, while the dues were but the trifling sum of $3 per year. Mr. Kremers, he said, was more familiar with the Geographical Society.

Mr. Kremers thought if the Section took membership in one of these societies it should in both, and stated that, while the volumes published were available in historical libraries, it would be of value to hold a membership.

Thereupon, Mr. Brundage, seconded by Mr. Rapelye, moved that the general Association be requested to provide membership for this Section in both these societies, and the motion prevailed.

The Secretary stated the effect of the third recommendation of the Chairman, that the Council be asked to provide funds for carrying on the work of the Section. This, it seemed to him, was rather a reflection on the Council, and the acting chairman ought not to voice his opinion on matters of that sort; but some member might move the adoption of the recommendation, if he saw fit.

Thereupon, Mr. Whelpley, seconded by Mr. Rapelye, made a motion to that effect.

General Secretary Caspari said that the committee of the Council having in charge the subject of annual appropriations made provision for every Section. Treasurer Sheppard said the Council had already voted a fund for the transaction of the business of this Section in the annual budget, and if they needed more money the Council could be asked for it. He insisted, therefore, that the motion was entirely out of order, and the acting chairman so ruled.

Secretary Mayo then read the following report:

REPORT OF THE SECRETARY OF THE SECTION ON HISTORICAL PHARMACY.

Shortly after the adjournment of the last meeting of the Association, the Secretary was informed by the Chairman of the Section, Mr. Ebert, that he proposed to make the history of pharmacy during the Civil War, the subject of special study by the Historical Section. With a view to eliciting information from those who participated in the Civil War, some 20,000 or more circulars were issued reading as follows:

AMERICAN PHARMACEUTICAL ASSOCIATION.

Committee on Historical Pharmacy.

The Historical Committee of the American Pharmaceutical Association wishes to collate data regarding the Military and Naval Pharmacy of the Civil War. All who had any connection with the pharmaceutical or medical purveying departments of the army or the navy, either Federal or Confederate, are invited to communicate with the committee. The committee would be pleased to learn the address of any one who was engaged in this work. The Section is particularly desirous of securing photographs or illustrations of this phase of the war. Suggestions looking toward the furtherance of this plan will be gratefully received by the chairman, the historian or the secretary.

A. E. EBERT, *Chairman*, 426 State St., Chicago, Ill.

ED. KREMERS, *Historian*, Madison, Wis.

C. A. MAYO, *Secretary*, 64 West Broadway, New York.

Through the courtesy of the wholesale druggists in the larger cities, these were distributed without cost to the Association.

The subject-matter of the circular being laid before the commanders-in-chief of the Grand Army of the Republic and of the Confederate Veterans' Association, both these officials included the circular in general orders issued from their respective headquarters. This insured the reading of the circular note before every camp of veterans whether members of the Grand Army of the Republic or of the Confederate Veterans' Association.

The historical material collected through this means was scarcely as valuable as had been hoped. The persistent and energetic efforts which had been made by the United States Government to collect the official papers and documents regarding the Civil War

have brought to light nearly all of these documents which have any historical value, and a large majority of them have been published and indexed in the monumental Records of the Rebellion, where, having been carefully indexed, they are available for reference by future historians. Some of the personal aspects of service in the Civil War brought out either by interview or correspondence with veterans have been used by the Secretary in the preparation of a brief paper on the Pharmaceutical Service in the Civil War.

Respectfully submitted, CASWELL A. MAYO, *Secretary.*

Mr. Mayo then continued:

I have no further report to make as Secretary, but should like to present a brief outline of a paper I have prepared, and I will be very brief, in accordance with the suggestion of the Chairman:

A study of the conditions existing in the medical supply service in both armies shows that the hospital steward of the Civil War, in the United States Army, occupied very much the same position that he does now. His position has been slightly improved in the last few years, but then, as now, he was barred from any possibility of promotion. As a consequence, the men connected with pharmacy who entered the service as volunteers—those gifted with special qualifications of education or high technical skill—nearly all went into the line, where there was a chance for promotion, because the private might become a brigadier-, or even a major-general; but to the pharmacist who entered the service as a hospital steward, all possibility of promotion was barred.

In the Confederate service the lines were somewhat more laxly drawn. My instructor in pharmacy, the gentleman by whom I was first employed, was a hospital steward, but accepted the position only with the proviso that they would give him the rank of lieutenant. They needed him badly, and gave him that rank. I don't think any similar case occurred in the armies of the North, and I don't know of another in the South. But it shows the lines were lax, and where a man of special attainments was required they had to make concessions to him.

At the close of the Spanish War, and for some years prior to it, I had been much interested in the position of hospital steward in the service; and when the troops were brought back to Montauk Point, I received, through the courtesy of the Secretary of War, permission to visit the camp there, and spent a week studying the conditions, and one result was, that I drafted a proposal for the organization of a pharmaceutical corps—a medical-service supply corps—as I thought on an entirely new basis. This medical supply corps did not touch the hospital stewards at any point; their duties and their positions were left untouched. My proposition provided for a corps consisting of a colonel for an army of a hundred thousand men, the lowest pharmacist in the corps to be a second lieutenant. After the publication of this suggestion, I chanced on the files of the *American Journal of Pharmacy*, and happened on a paper taken from the *Army and Navy Journal* in 1865, and there, contributed over the signature of the single letter "N," as I remember, was a letter showing an insight into the conditions that existed during the War, and the proposition to organize a corps of apothecaries, with an apothecary-general with the rank of colonel, and graded officers down to second lieutenant as brigade apothecary. I cite this as an interesting proof that two independent observers, studying the situation with some degree of care, had arrived at exactly the same conclusion; and I am confident that if the efforts of this Association had been directed in this line, rather than towards the advancement of the present hospital stewards, we would have had much better results.

That, gentlemen, is my excuse for presenting this as an independent paper, the carrying out of the wishes of the Chairman.

Mr. Chas. E. Caspari moved to accept the report of the Secretary, and the motion prevailed.

Chairman Ebert, in this connection, told of the efforts of the Chicago Veteran Druggists' Association to aid the American Pharmaceutical Association in the attempt to raise the standing of the hospital stewards in the Army, by the sending of a special emissary to Washington in the person of Dr. Thos. N. Jameson, a National politician. He quoted Dr. Senn, of Chicago, Surgeon-General of Volunteers in the Spanish War, as saying that the method that had been pursued was all wrong; that the thing to do was to begin at the top and work down—that the effort should be to have created the office of Apothecary-General of the Army, a grade that existed during the Revolutionary War, and let the hospital stewards alone. President McKinley was a friend of the cause, and told Dr. Jameson that he favored the passage by Congress of an act creating the office of Apothecary-General, with the rank of Major: he did not favor the rank of Colonel, because that would conflict with the Medical Department. The proposition went before the Committee on Military Affairs, and Gen. Sternberg appeared before that committee, but in the wrangle that subsequently ensued Congress adjourned without doing anything. In his judgment, the thing to do was to create the office of Apothecary- or Pharmacist-General of the Army, and possibly of the Navy.

Mr. H. M. Whelpley being given the privilege of the floor, proceeded to exhibit a unique and historic gavel, made of a pestle pierced by a spatula, which had been sent from the Illinois Pharmaceutical Association. He moved its acceptance by the Section, and the motion carried unanimously. Mr. Whelpley presented a short paper on the subject. *

Mr. Wilbert then presented a paper he had prepared on the subject of "Recorded History of Pharmacy During the Civil War."

Mr. Hancock moved to accept and refer to the Historian. Chairman Ebert commended this as a wise suggestion, and just in line with his views, because if such papers went to the Publication Committee they would not know what to publish and what not to publish. It was so ordered.

Mr. Helfman, of Detroit, called Mr. Wilbert's attention to some of the makeshifts resorted to in the Confederate Army to eke out their very scanty supplies, as told in Rhodes' History of the United States, 5th volume. In the desperate straits they found themselves, an almost diabolical ingenuity was developed in such matters.

The Chair stated that Mr. P. C. Candidus, of Mobile, was one of Forrest's men, and doubtless he could give the members some entertaining war experiences.

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* This paper as well as others presented to the Section, read either in abstract or by title, are in the possession of the Historian, Edward Kremers, Madison, Wis., but could not be abstracted in time for use in this volume. Some of these papers will no doubt be published in full in the pharmaceutical journals.—THE GENERAL SECRETARY.

Mr. Candidus then came forward and gave the following interesting recollections of his war service:

It has been a long time since the war, and we forget many things, you know, with the lapse of years.

At the first call for troops, I helped to get up the first regiment in Mississippi, and we divided the offices among ourselves, of course, before the regiment was organized. We wanted good men, you know. We elected as our chief officer a Mr. Wesey, who was a Colonel in the Mexican War, a very good man. There was another man there by the name of Scott, who had also been in the Mexican War, and a good man; and I was to be the second lieutenant, but they objected to a Northern man having any office. When the election of officers came off, I was defeated. So I gave up my job, until our army was at Bowling Green, Kentucky, with Gen. Buell on one side and Sydney Johnston on the other, and our troops were hard pushed. They called for 10,000 troops for sixty days, and we got them up, and sent 5,000 to Columbus, Kentucky, and 5,000 to Bowling Green; and I was a kind of medical purveyor for the whole division, under Gen. Davis. We left our comfortable homes and came to Bowling Green in the winter: no tents, nothing—but slop, and rain, and snow, and hail; all kinds of weather. When we got to Bowling Green, I had to get hospitals for these troops. The others that had been there before we arrived were well fixed up, but we were in a bad fix. In less than three days, our men began to show the result, and the hospitals were soon full, and we lost on the whole expedition over 5,000 men, without firing a gun. The medicine principally given—we had plenty of it, then—was *spiritus frumenti*. That was about the only thing we gave, and it was a great success. But we certainly lost five thousand men.

Well, I was a medical purveyor, or a sort of one, for sometime in the Confederate service, and blockade-runners came into Wilmington, North Carolina, and Mobile, Alabama, with supplies for a while; but they were soon stopped. We got all the medical supplies we had from Europe; I had to press my part—what we called "pressing" at that time; giving Confederate notes for it. After a while, medicine became so scarce that, while I could get requisitions for it, they could not be filled and I became disgusted and retired—gave up my office and joined Gen. Forrest as a high private; but they advanced me to orderly sergeant, and our company never suffered for something to eat. But in the medicine line, the supplies, after the blockaders got in their work, gave out.

Mr. Whelpley stated that Mr. H. M. Pettit, of Carrollton, Mo., who had served as pharmacist in the Confederate army from the beginning to the close of the war, had promised to give a talk at the next meeting of the Missouri Association, when he hoped to have taken down something that would be of interest to this Section. The Chairman said a paper had been received from Mr. Pettit along the line of Mr. Whelpley's remarks, and he thought it would be well to refer it to the Historian. It was so ordered.

Mr. E. G. Eberle, of Texas, presented a paper on "Confederate Resources." He explained that he was not the author of the paper, but said that when the Historic Section sent out notices that such contributions were desired, he wrote to a number of persons, and among others to Dr. C. H. Tebault, of New Orleans, who told him where he thought he could find a paper he had written some years before on this subject.

Secretary Mayo stated that through the courtesy of Gen. Stephen D. Lee, Commander-in-Chief of the Confederate Veterans' Association, he had had some correspondence with Dr. Tebault, who, he believed, was Surgeon-General of the Confederate Veterans, and found he had prepared two papers, to be read this week at the meeting of the Association of Confederate Surgeons in Savannah. Dr. Tebault was unable to supply a copy of either paper at the time, but had promised that copies should be forwarded for the Section files. In these papers he traverses other ground than that covered by the paper just presented. The Secretary said he had also had some correspondence with Dr. Peyre Porcher, and had tried to get for the Section a copy of his "Resources of Southern Fields and Forests," but had not been able to do so. Mr. Hancock, of Baltimore, thought he could furnish a copy.

Mr. E. V. Howell, of North Carolina, said he had collected some interesting data at Raleigh a few years ago, in regard to the prices of drugs in the Confederacy after the blockade of Wilmington, and they were very high. Among other things, he had found an early copy of the *Druggists' Circular*, issued in 1857 or '58, in which there was an account of the wooden leg of Santa Anna being on exhibition in a drug-store in Philadelphia.*

On motion of Mr. Hancock, the paper of Mr. Eberle was received and referred to the Historian.

The Chair called for the Historian's report, which he said in the future would probably be made first, with papers and reminiscences to follow.

Mr. Kremers presented the following:

REPORT OF HISTORIAN.

Somewhat more than a year ago, steps were taken by your Historian to secure the co-operation of the authorities of the Smithsonian Institution. At the time of the Kansas City meeting no reply had been obtained. However, shortly thereafter a favorable reply was received from the Assistant Secretary of the Smithsonian Institution who is in charge of the U. S. National Museum. Congress has appropriated $3,500,000 for a new granite building which is now being constructed, and which may be completed in the course of two or three years. Meanwhile the historical material collected by your officer is being housed temporarily in a fire-proof structure.

Less than three months after the Kansas City meeting Dr. Hoffmann died. The collection of objects of historic interest, promised by him to this Association on condition that a national pharmaceutical museum be established, preferably at Washington, has since been sent by his widow.

* This statement was received with signs of incredulity by Mr. Hallberg *et al.*

In the shipment of the box containing the Hoffmann collection, both Mrs. Hoffmann and your Historian enjoyed the most generous assistance on the part of the firms of Schimmel & Co., in Germany, and of Fritzsche Bros. in New York. Not only were the members of these firms so kind as to superintend the shipment in Germany and to secure its release from bond in the New York Customs House, but they generously offered to pay all of the transportation charges from Charlottenburg, Germany, to Madison, Wisconsin, as well as all customs and other fees. Such liberal generosity certainly merits the thanks of the Association.

Some idea of the nature of the Hoffmann collection can be obtained from the labels of the several packages as recorded by Dr. Hoffmann himself.

A. Five packages of personal effects.

1. University lectures, etc.
2. Botanical Equipment. } Prizes by the German Apothecaries Society for
3. Blow-pipe Equipment. } apprentices.
4. Certificates, portraits, photographic groups, medallions, badges.
5. Diplomas, etc.

B. Thirteen packages of pamphlets, etc., of which Dr. Hoffmann is the author.

1. A collection of pamphlets by the author.
2. A duplicate collection.
3. Additional pamphlets, etc.
4. Dr. Hoffmann's biographies of Flückiger, Reber, etc.
5. Other biographies.
6. Signatures for the herbarium, 1859.
7. Hirzel's Zeitschrift f. Pharmacie, 1849–1856, containing Dr. Hoffmann's earliest contributions to pharmaceutical literature.
8. Caspar Butz's Monatshefte, containing contributions from Fr. H.
9. "International pharmaceutical congresses." Reprints from the A. J. Ph., 1900.
10. Semi-centennial address, A. Ph. A., 1902. Duplicates.
11. Centennial of Am. Pharm. literature. Reprints from Am. Dr. and Ph. Rec.
12. Reports to the Pharmaceutische Zeitung.
13. Historical Society of New York.

C. Eighteen packages of general historical material.

1. Letters, etc., from Flückiger, Brunnengraeber, etc.
2. Letters and books by Philip Phoebus.
3. Ephemeral publications, etc.
4. Academical and scientific addresses.
5. History of pharmacy.
6. Contributions to the history of chemistry.
7. Historical study of drugs.
8. Pharmaceutical education and institutions.
9. Medical education and history.
10. Pharmaceutical legislation.
11. Revision of the U. S. Pharmacopœia.
12. Association meetings and exhibits.
13. Botanical gardens.
14. International pharmaceutical congresses.
15. Relation of pharmacists to physicians and nostrums.
16. Addresses delivered before the N. Y. gesselig-wissenschaftlicher Verein.
17. Semi-centennial of the A. Ph. A., 1902.

For more than a month, during the present summer vacation, your Historian has spen

several hours each day in mounting and classifying the numerous papers, pamphlets, etc., of the Hoffmann collection and of much other material that has thus far accumulated. A classification has been adopted temporarily, but as this will have to be changed more or less as the material is being gone over again and again, no further report of this aspect of the work will be made at the present time.

After your Historian had left his home for Kansas City last year, the following letter was received from Mrs. Maisch, dated Philadelphia, August 27, 1904:

PROFESSOR EDWARD KREMERS.

Dear Sir: I received your favor of recent date on the 25th inst. In answer I will say that I, as well as my family, are willing to give the documents of my late husband to the American Pharmaceutical Association upon the condition that there will be a good place in the Smithsonian Institution or elsewhere, to receive them. I should not like to have them packed in a trunk, and carried from place to place, but as soon as I can be assured that they will have a permanent home, I will be more than willing to place the mementoes of my departed husband where they will tend to preserve his true relation to the growth and progress of American pharmacy. Whatever may be of value in the scheme of the Historical Committee, you may depend upon receiving as soon as I am given the above assurance.

I will talk the matter over with Mr. Wilbert personally who will come to see me as soon as he returns from his vacation.

Very respectfully yours, CHARLOTTE J. MAISCH.

5806 Haverford Ave.

As soon as the Maisch collection can be incorporated, this Association will have a nucleus for a Pharmaceutical Museum at Washington which will prove very gratifying to those who are especially interested in this aspect of our Association activity.

While in its initial stages, this work will be more than gladly done by volunteers; clerical help however will soon become a necessity and funds for other purposes will gradually become more and more essential to its complete success. An attempt to secure an endowment from an ex-pharmacist, whose generosity has run toward the building up of collections not pharmaceutical, has failed, but this is no reason why we should give up the idea of securing such an endowment. No American pharmacist, be he manufacturer, jobber or retailer, can do more for the national recognition of American pharmacy and for the perpetuation of his name than by the establishment of an endowment fund, the interest upon which alone is to be used in the furtherance of this work.

Since the Chairman and Secretary, elected at Kansas City for the proper administration of this Section have relieved your Historian of the necessity of providing a program for this meeting, he has been in a position to give his individual attention to the work outlined in his last report and to other miscellaneous routine duties. Several of the papers to be presented at this session are the outcome of these activities.

While the general work of collecting has been going on with gratifying results, a special attempt has been made to collect material for a better understanding of the N. R. D. A. which existed from 1883–1887. In as much as there are no bound printed proceedings, and owing to the renewed activity of the retail druggists of this country, as organized in the N. A. R. D., the collection of documentary material and of reminiscences from those who took an active part in the first association, seemed particularly timely. Some of the results will be presented at this session.

The collection of material for biographies, the basis of all historical work, has increased very materially. The growth along other lines has been proportionate.

The following donations have been received since the last report was made:

J. H. Beal—Photographs.

H. Biroth—Manuscript of a biographical sketch of F. Mahle.

A. E. Ebert—Letters, etc.

E. J. Kennedy—Manuscripts by Prescott and Rice; copies of Dr. Rice's article on pharmacopœias.

J. W. T. Knox—Johnson Co., Texas, Board of Pharmacy certificate.

E. Kremers—Miscellaneous documents, etc.

J. U. Lloyd—Lloyd Library Bulletin; Postal card A. Ph. A., 1878.

H. B. Mason—Photographs.

C. A. Mayo—Newspaper clippings pertaining to pharmacy.

W. A. Puckner—Letters.

E. A. Sayre—Manuscript and documents N. R. D. A., also Kings County Pharm. Society.

H. R. Strong—Copies of Exposition number National Druggist.

H. M. Whelpley—Miscellaneous documents.

M. I. Wilbert—Photographs.

In addition catalogues have been received from several colleges and pharmaceutical manufacturers.

In closing this report your Historian once more desires to express the hope that all members who are interested in the history of their calling will confer with him, if possible. From the point of view of Association activity the beauty of the work of this Section lies in this, that each and every member can contribute something with but insignificant effort. The work of this Section should represent the product of leisure hours pleasantly and profitably spent.

Mr. Kremers presented, in connection with his report, a lot of documents and publications that he had gathered from different sources, and requested that members who had any documents of any character bearing on the work of the Section would either bring them to the Association meetings or communicate with some of the officers of the Section. Some of the documents referred to the old National Retail Druggists' Association, whose reports were never printed and whose minutes were destroyed by fire.

Mr. Eliel gave a somewhat detailed account of the rise and fall of the National Retail Druggists' Association, and told how the effort to establish an organ of that Association was thwarted by the attitude of the drug journals towards it.

On motion of Mr. Boring, the report of the Historian was referred to the Publication Committee.

Mr. E. H. Gane was then asked to exhibit the working of a device used many years ago for making gelatin-coated pills. Mr. Gane said he had no formal paper to present, but he thought this device might be interesting to the members, inasmuch as it was the first used in this country for gelatin-coating pills on a large scale. It originated in France somewhere in the early '30's, but was not adopted in this country until 1869 or 1870. The moulds were of wood, in strips about twenty-four inches long, with projecting needles to impale the pills, which were thus dipped into the liquid

gelatin. The operation was thoroughly explained. These moulds were succeeded by metal moulds, the working of which was also explained.

Upon inquiry by Mr. Mayo, Mr. Gane said he could furnish a duplicate set of these moulds for the Section, and Mr. Mayo moved a vote of thanks, which was carried.

A paper by Mr. E. A. Sayre, on "The Kings County (N. Y.) Pharmaceutical Society," was, on account of its length, read by title and turned over to the Historian.

Mr. Chas. E. Caspari asked if the papers received by the Section and referred to the Historian without reading would be abstracted and published in the Proceedings or simply filed with the archives, in which case the members would know very little about the papers.

The Chairman stated that his idea was, that the papers too long to be read, and those of length that were read, should be turned over to the Historian and by him abstracted for publication; and if he could not make such abstracts in time for this year's Proceedings, then they could be published in the Proceedings of next year. This method would give a condensed statement of everything brought before the Section. The papers themselves, of course, would go into the archives of the Association.

The General Secretary said he had had trouble with this matter last year, the papers being published by title and reference made to where they could be found *in extenso*. He wanted to know for his own information what course was to be pursued this year. He agreed with the Chairman that many of the papers would be too long to publish in the Proceedings, and that abstracts should be prepared for publication.

Mr. Henry Kraemer, of Philadelphia, spoke of the peculiar difficulty of abstracting these historical papers, and thought much of the value of the papers would be lost unless the authors themselves made the abstract, as in other Sections.

The Chairman expressed the fear that there would be very few contributions if the writers of the papers were required to abstract them. He thought this properly the duty of the Historian, and that he could do it better than any one else, because so much matter would be duplicated, and he could sift out and present only what was desirable and proper.

Mr. Hynson referred to the effort now being made to limit the number of pages in the Proceedings, and wanted to know why the General Secretary could not inform the Historian as to how many pages he could spare him for this work, and then if he found afterwards he would have more, the Historian could furnish additional abstracts.

Mr. Kremers remarked that the Association last year had said the officers of the Section were expected to see that a program be printed in advance of the meeting, and abstracts made. He had written the Secretary of the Section telling him he had some papers and would be glad to turn them over, but he was out of town, and he asked some of the authors to prepare abstracts themselves.

The Chair suggested that a paper contributed by Mr. Joseph Feil, entitled "The Drug Trade of Cleveland prior to 1875," be referred to the Historian without reading, as it was a paper of some length, and it was so ordered.

Another paper on "Reminiscences from Watertown, Wis.," by E. W. Johnson, was also referred without reading.

The Chair stated that Mr. Hancock, of Baltimore, had a directory of prominent druggists in Baltimore in 1833, and, without objection, it would be received and referred. Mr. Hancock consented to this.

Mr. Charles E. Caspari was then asked to read a sketch of Charles Caspari, Sr., which he did, explaining that the Historian of the Section had asked him about four months before to gather and present any data he might be able to find concerning his paternal grandfather.

In connection with his paper, Mr. Caspari stated that, two or three years ago, he had happened on an old volume entitled "Maryland Journal of Pharmacy," in a second-hand bookstore in St. Louis, and upon observing the date 1859–60 he had turned to the index and found two articles contributed by his grandfather, one on oxide of zinc and the other on nitrate of bismuth. He said he would be glad to contribute this volume to the Section, if it was desired.

Mr. Hancock moved to receive Mr. Caspari's paper and refer to the Historian, and to accept the proposed gift with thanks. The motion was seconded and carried.

Mr. Whelpley presented in abstract a paper on "The First Four Meetings of the A. Ph. A."

In connection with his paper, Mr. Whelpley made an interesting exhibit of a small volume containing the proceedings of the first five meetings of the American Pharmaceutical Association, and contrasted it with the volume of 1904 proceedings—which was reduced from that of 1903 and 1902—showing how the proceedings had grown in size.

On motion of Mr. Beal, the paper was ordered to take the usual course.

A paper by Mr. Thomas A. Wiegand on the "Early History of the A. Ph. A.," was received and referred. The Chairman explained that Mr. Wiegand was the only man now living who was at the first meeting of the American Pharmaceutical Association in 1852, and that he was too modest to take active part in it, although he met everybody there. Mr. Whelpley said the reason he didn't take part was probably because it was strictly a delegate body, and the minutes showed that Mr. Wiegand, as a visitor, was extended the courtesies of the floor along with other visitors.

Mr. E. G. Eberle presented a paper on the History of Pharmacy in Texas, in which an effort is made to show by comparison how the drug business in its various branches has progressed in Texas. Reference is made to the laws governing pharmacy, to the state association, the school of pharmacy, the geography, flora and materia medica of the state.

In connection with his paper, Mr. Eberle offered to present the Section a general scrap-book of Texas. This proposition was accepted with thanks, and the paper was received and referred.

Mr. Wilbert, of Philadelphia, exhibited a scrap-book of historic prints which he had collected, and which had been presented to the Section at the Kansas City meeting, but which the Historian had asked him to elaborate on by putting additional data underneath the pictures. Mr. Wilbert, in this connection, also presented a collection of medals and early programmes of the meetings sent by Mrs. Maisch, and suggested that it would be proper for the Section to thank the donor. On motion of Mr. Hancock, the Secretary was instructed to acknowledge the gift and express the thanks of the Section to Mrs. Maisch for the donation.

Secretary Mayo stated that Mr. C. Lewis Diehl had been kind enough to present the Section with the original manuscript of the Report on the Progress of Pharmacy for the years 1867 and 1868. This was before the days of typewriters, and the manuscript was in the handwriting of Mr. Diehl, and showed an immense amount of labor. He moved that the Association accept the gift with thanks and pass over to the archives. Mr. Diehl called attention to the fact that this manuscript, containing over 700 abstracts, represented only a part of the labor involved, as it had to be rewritten entire. The motion to receive with thanks prevailed.

Secretary Mayo stated that Miss Adelaide Rudolph, of Cleveland, had devoted a great deal of time to the collection of matter concerning Dr. Rice, and had prepared several scrap-books containing everything she could find about him. These scrap-books were arranged under general heads and sub-divided into other heads. She had sent Volume 1 of this series as a gift to the Section, and he moved that it be accepted with the thanks of the Section for this valuable contribution.

This motion was seconded by Mr. Whelpley and carried.

Mr. Kremers, in connection with this gift, complimented the work done by this lady, but lamented the fact that she had been hindered in her efforts by the seeming reluctance of pharmacists to whom she appealed to send letters and other matter desired—even by way of loan—to her. He made an appeal for more generous treatment in this behalf.

Mr. Diehl, of Louisville, said he had quite a number of letters from Dr. Rice, but they were mostly about some matter he was engaged on at the time. He would be glad to contribute them, however, if they would be of any use.

Mr. Kremers said he would be glad to get these letters. He again called attention to the desirability of making scrap-books conform to the standard as to the size of pages heretofore fixed for this work, and exhibited a book showing what was desired. He especially invited contributions of biographical matter, and asked for letters—letters not for publication, but for preservation in the archives, where they may be consulted by the future Historian.

A paper on George Wansey Andrews, by John F. Hancock, was read by title and referred, with consent of the writer.

Secretary Mayo gave a brief abstract of a paper by H. P. Hynson on Professional Pharmacists in America.

As *apropos* to the reference made by the Chairman to the position of Apothecary-General of the United States Army, Mr. Mayo said he desired to call attention to a copy of a work by Dr. James Cuthbert, A. G., U. S. A., entitled "Lectures on the Adulteration of Food and Culinary Poisons," bearing date of 1823, presented by Mr. W. C. Wescott, Local Secretary, which he moved to accept with the thanks of the Section. The motion was seconded and carried.

Mr. Whelpley presented a paper on "Drug Periodicals in Missouri."

Mr. Wilbert presented in abstract a paper on "Early American Formularies," and exhibited in connection with his subject some small pamphlets of hospital formulas, some of which he said he would present to the Section. The paper was received and referred.

Mr. J. T. McGill, of Nashville, presented in abstract a paper on the "Department of Pharmacy in Vanderbilt University," which was received and referred.

On motion of the General Secretary, some old documents and papers in his hands, including some manuscripts in the original handwriting of William Procter, Jr., were ordered transferred to the Historian of this Section.

On motion of Mr. Mayo, the thanks of the Section were extended to Messrs. Fritzsche Bros., of New York, for their generosity in defraying all the expense, including customs charges, incident to the importation from Europe of the exceedingly valuable Hoffmann collection, referred to in the address of the Historian.

The Chair announced that nominations for officers of the Section were in order, and Mr. Charles E. Caspari nominated Mr. John F. Hancock, of Baltimore, for Chairman. The motion was seconded by Mr. Wilbert, and nominations were closed on motion of Mr. Hallberg. Mr. Caspari then moved that the Secretary of the Section cast the ballot of the Section electing Mr. Hancock Chairman for the ensuing year, and the motion prevailed. The Secretary announced that he had cast the ballot as directed, and the Chair declared Mr. Hancock duly elected. (Applause.)

Nominations for Secretary were called for, and Mr. Eberle nominated Mr. M. I. Wilbert, of Philadelphia, but Mr. Wilbert declined, saying it was impossible for him to serve. Mr. Wilbert then nominated Mr. Charles E. Caspari, but he also declined, on the plea that he was already Secretary of another Section. Thereupon, Mr. Whelpley nominated Mr. C. S. N. Hallberg, of Chicago, which nomination was seconded by Mr. Caspari, who moved that nominations be closed and the Secretary cast the ballot of the Section electing Mr. Hallberg to this office. This motion prevailed, and the Secretary announced that he had cast the ballot as directed.

The Chairman introduced Mr. Hancock to the Section, saying he was glad to be relieved himself, as it was the hardest work he had done in years.

Mr. Hancock expressed his appreciation of the honor conferred. He was deeply interested in the work, and would do all in his power to further it. He had every confidence in the new Secretary, whom he expected to do all the work. (Applause.)

Mr. Whelpley reminded the retiring Chairman that when he was President of the Association in the semi-centennial year he read the Presidential addresses that had been delivered during the fifty years before, and that of President Hancock stood out pre-eminent, over and above all previous addresses, as an unusually able document—in the manner in which the members at this meeting had recognized that of Mr. Beal to stand out pre-eminent over and above other Presidential addresses.

Mr. Hancock took the Chair, and introduced Mr. Hallberg, the new Secretary, who said he would not have accepted the position except for the assurance that the Historian would do all the work.

Mr. Charles E. Caspari nominated Mr. Edward Kremers, of Madison, Wis., for Historian. Mr. Wilbert seconded the nomination, and Mr. Whelpley moved that nominations be closed and that the Secretary cast the ballot of the Section electing Mr. Kremers to this position. The motion prevailed, and Secretary Hallberg announced that he had cast the ballot as directed.

Mr. Kremers said he thought it would be proper to recognize in some other fashion than had been done heretofore the gift of Mr. Hoffmann to the Association. He therefore moved that the retiring Chairman, an old-time friend of Dr. Hoffmann, be requested to extend the thanks of the Section to Mrs. Hoffmann for the collection she had forwarded.

This motion was seconded by Mr. Beal and carried unanimously.

Mr. Wilbert moved a vote of thanks to the retiring officers of the Section for the very able manner in which they had conducted the business of the Section during the past year.

The motion was carried unanimously.

On motion of Mr. Hallberg, the Section adjourned.

MINUTES

OF THE

SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION—WEDNESDAY MORNING, SEPTEMBER 6, 1905.

The Section was called to order at 10 : 30 a. m. by Chairman Harry B. Mason, of Detroit. Mr. Francis B. Hays, of New York, an associate member of the committee, was called to the Chair, while Mr. Mason read his address as follows :

Fellow-members :

In my address as Chairman of this Section at Kansas City last September the statement was hazarded that the association year then closing had ushered in what would prove to be a new era in the evolutionary development of the calling. It was pointed out that the movement for state legislation in pharmacy, entered upon thirty years before, and compelling druggists to undergo state board examinations before they could practice their calling, had been brought to its culmination during the year by the action of Congress in providing Indian Territory with a statute; that the next stage in the legislative process had been immediately approached by the enactment in New York State of a "prerequisite" law making graduation from a reputable college of pharmacy compulsory on the part of licensed proprietors, that this new movement would proceed slowly but nevertheless surely towards its completion as the previous one had done; and that from these and other phenomena it was evident that we were clearly and definitely entering upon an epoch of more severe educational standards in pharmacy, and an epoch consequently of greater commercial and professional betterment.

That this prediction was justified is abundantly apparent from the developments of the year which has elapsed since we gathered in Kansas City last September. Of first importance are the acts of two other states in ranging themselves alongside New York in the vanguard of the new movement for compulsory graduation in pharmacy. The Pennsylvania pharmacists have secured an amendment to their pharmacy law providing that hereafter a candidate for the board of pharmacy examination who desires to become the proprietor of a store "must present satisfactory evidence of being a graduate of some reputable and properly chartered college of pharmacy." In Wisconsin, the Board of Pharmacy has boldly established the graduation requirement on its own initiative. It has passed resolutions providing that after July 1, 1905 (a date now passed), all candidates for examination must have had one year of high school work or its equivalent; that after July 1, 1906, they must have had one year of at least 32 weeks in a school of pharmacy recognized by the Board; and that after July 1, 1907, they must have had a full pharmacy course. The Pennsylvania amendment affects the proprietor only, but the

New York law and the Wisconsin resolutions make no distinction between proprietor and clerk.

If we do not forget Hawaii, which enacted the Beal model law of this Association two or three years ago, including even the graduation requirement contained in that measure, we see that four states and territories now demand that the pharmacist of the future shall be properly trained for the responsible duties of his occupation in an accredited school or college of pharmacy. A fifth commonwealth, Minnesota, endeavored likewise to secure the enactment of a graduation prerequisite law this year, and the attempt would doubtless have succeeded had it not been for the strange and unaccountable opposition exerted at the eleventh hour by a group of pharmacists themselves—an occurrence which brings home to us most forcibly the truth that in this demand for better things we shall need to educate those *within* no less than those *without* our ranks to the cardinal importance and necessity of the step. In the meantime, however, it is most reassuring to observe that at least three State Associations, convening in annual session during recent months, have decided to secure graduation prerequisite legislation at the earliest practicable time—and the end is not yet!

But the educational progress of the last year has by no means been limited to the impetus given the graduation prerequisite movement. Several boards of pharmacy, realizing that the time has come for advances all along the line, have increased their requirements with a clear-sighted courage which should win our support and admiration. The Ohio Board has led the way by resolving that hereafter no candidate shall be given "experience" credit for time spent in college unless that college insists upon one year of high school work or its equivalent as an entrance requirement, and unless it exacts 80 per cent. of attendance upon two distinct college years of not less than 26 weeks each, The Indiana Board has passed resolutions of practically the same import, with the additional provision that "recognized" colleges must give work enough to render it impossible for the student to be employed in a store contemporaneously. The Arkansas Board has resolved that in the future all candidates for examination must have had a general education equivalent to that demanded as an entrance requirement by the graded high schools of the state; and the Oklahoma Board, which registers candidates upon diplomas, has decided that only those colleges will be thus accredited which require a full high school training or its equivalent as an entrance standard, and which have courses comprising two school years of not less than 20 weeks each. These four boards have rendered a distinct service by showing what can be done intelligently and fairly without waiting for the slow and snail-like progress of legislation; and every sincere friend of pharmacy now looks to the boards of other states to follow in the path which has been blazed by these pioneers. Is there not here a topic which might be discussed very profitably by the Association of Boards this week ?

One other educational advance of the season has yet to be recorded. The Michigan pharmacists, after years of agitation and trial, have secured the enactment of a law which, among many other excellent features, provides that all future candidates for the board examination must have had a general education representing two years of high school work.

What, then, to recapitulate, has the last year registered in the way of educational progress? Pennsylvania and Wisconsin have established the graduation requirement, following in the footsteps of New York and Hawaii; Michigan has established a preliminary standard of two years of high school work; Arkansas has established the grammar school standard; Oklahoma has declared that it will hereafter register upon diploma only those graduates who come from colleges requiring a full high school course; and Ohio and Indiana have decided not to give "experience" credit to graduates unless they are from institutions which demand one year of high school work, and which have courses conforming to certain prescribed curriculum standards. When we consider these

several advances; when we realize that they are all along new lines of progress; when we recall that we have a "Conference of Pharmaceutical Faculties" which is now beginning to exert a standardizing influence; and when we remember that a "National Association of Boards of Pharmacy" was established at Kansas City last year, an association destined to be of signal service in this new era of higher educational requirements—when we consider these various phenomena we shall make no mistake by harboring in our breasts the keenest and most sanguine hope for the future.

Already the effects upon our educational system in pharmacy have begun to be apparent and salutary. Colleges have here and there elevated and strengthened their courses and increased their entrance requirements, while the work of discriminating between the schools, and putting the stamp of approval and recognition upon the better and the more efficient institutions, has been given a headway which must seem ominous to the colleges whose work falls below the standard. In New York State the four colleges of pharmacy have made their entrance requirements and their curriculum standards conform to the demands of the prerequisite law. In Ohio some if not all of the many pharmaceutical schools in the state have likewise effected the improvements made necessary by the resolutions of the board of pharmacy. And the New York, the Pennsylvania and the Ohio Boards have all issued lists of colleges whose graduates, and whose graduates only, will be given recognition under the new order of things. There are over eighty schools of pharmacy in this country, and yet the New York list contains but 16 of them, the Ohio list 17, and the Pennsylvania list the 21 colleges comprising the membership of the Conference of Pharmaceutical Faculties. Before other schools can secure place upon the rolls of honor, and make it possible for their graduates to obtain recognition in these three states, they must conform to the standards and come up to the scratch line.

There is, we must remember, still another agency operating to standardize our colleges of pharmacy and to separate the more efficient from the less efficient institutions. I refer to the Conference of Pharmaceutical Faculties. After several years of discussion and preparation, this body formulated definite membership requirements last year. Hereafter it will be necessary for every college which desires admission into the Conference to have been in existence continuously for five years, to have a grammar school entrance standard, to require of each student for graduation not less than 500 hours of lecture and 600 hours of laboratory work, and to give a total course of instruction covering a period of at least 40 weeks.

These membership requirements are not severe; many zealots think they are discouragingly low and unsatisfactory; but we must creep before we can walk, and we should realize that the only reform which ever proves permanent is that which reckons with human nature and human progress as they exist at the moment, and which goes neither so fast nor so far that it is denied hearty support and encouragement. The Conference has made a beginning—this is the important point. It has entered the wedge, and strong arms will not be lacking to drive it farther and farther home as the knots and the knarls gradually give way.

In the meantime let us realize that the membership standards of the Conference, while not so high as some of us in our zeal would have them, are yet severe enough to shut out many of the pharmaceutical schools of the country. Already, then, the Conference has begun the work of discrimination between institutions, and we have an inkling of how valuable this work will be when we recall, what has already been stated in this address, that the Pennsylvania Board of Pharmacy has accepted the list of 21 schools comprised in the membership of the Conference as the colleges whose graduates will be given recognition under the operation of the newly enacted prerequisite law of the state. That the standards of the Conference—those now established as well as those to be established in the future—will become here and there the standards of one state board and another, is certain; and thus the work of this body is seen to be pregnant with usefulness and

possibility, and not to be merely deliberative and academic in character as it has necessarily been during the first few years of preparation.

Returning now to the subject of graduation prerequisite enactments, it is of course clear that the fundamental purpose of such legislation is to demand a greater degree of fitness from the practitioner of pharmacy. But we have seen that incidentally these laws have had no less salutary an influence in elevating and standardizing the work of our colleges and schools, and particularly in forcing upon them better entrance requirements. This, indeed, is one of the most vital and important aspects of the prerequisite movement. In a debate before this section last year—one of the most able and important debates within the recent history of the association—several high-minded and earnest teachers protested that while higher entrance requirements should unquestionably be imposed, the good colleges had always been absolutely helpless to establish them. For the very instant they were to raise the bars the rejected students would pass on to the open and hospitable doors of the poorer schools, and thus the cause of educational pharmacy would be retarded instead of advanced. "Give us graduation prerequisite laws," said these teachers; "give us laws which will demand certain entrance standards of schools and which will deny recognition to the institutions failing to conform to these standards; protect us from cheap and unfair competition in this manner, and we shall then be glad to do what it would otherwise be suicidal for us to attempt."

Now in the light of this earnest and rational appeal it can only be regarded as unfortunate that the Pennsylvania prerequisite law establishes no entrance or curriculum standards of any sort or kind whatsoever. It may be argued in defense that the Board of Pharmacy has assumed an authority under the rather adroit language of the amendment * to discriminate between schools, and that it has acted wisely in deciding to recognize the 21 members of the Conference of Faculties. But no such authority and autocratic power should be vested in the Board of Pharmacy of any state. The boards themselves would be the last to desire it. It would enable one board to undo what another board has done. It would thus be fatal to permanence and stability of action. It would cause boards to be flooded with petitions and complaints from candidates and pharmacists who thought their requirements too severe. It would subject the whole disposal of standards to the dictates of graft and political influence. In many states it would result in a fight and scramble on the part of colleges with easy consciences to gain representation on the boards and to dispose of things in their own selfish interests.

Of the three states of the union proper which now demand graduation in pharmacy, two of them, New York and Wisconsin, have established a preliminary requirement equivalent to one year of high school work, and they have likewise established certain curriculum standards also. So far only Pennsylvania has ignored this vital necessity, and perhaps no particular harm will have been done if the same mistake is avoided with the several prerequisite laws which are quite sure to be enacted within the next few years. But I can only regard it as ominous that from certain quarters during the year has come the declaration that future prerequisite laws, unlike the New York amendment and the Wisconsin resolutions, should stop with making the college course compulsory, and should have nothing whatever to say about preliminary requirements. I believe this to be dangerous gospel and I think we cannot correct it any too soon or any too vigorously.

And what, forsooth, are the reasons advanced why we should establish no preliminary standards in our prerequisite legislation? There are only two of any consequence, and both are equally unsound. One is that it would not be fair to future candidates to keep them in the public schools a year or two longer, and the other is that if we increase the standard of general education we shall cause a stringency in the clerk market.

The first reason seems to me almost childish. We cannot abort the whole prerequi-

* Every candidate "must present satisfactory evidence of being a graduate of some reputable and properly chartered college of pharmacy."

site movement out of sympathy for a few clerks who are anxious to get their certificates at the earliest possible moment regardless of competency. If we must coddle and nurse them along, why do them the cruel unkindness of asking them to go to the college of pharmacy, or even to pass through four years of "apprenticeship" at low wages? It is absurd! And yet, from this very viewpoint of sentiment and sympathy for the clerk, are we not after all doing him a great kindness instead of an injury by compelling him to undergo that degree of preparation for his calling which will vastly increase his chances for success and at the same time exempt him from a certain class of cheap competition?

The argument that an elevation of preliminary standards would lessen the supply of clerks seems to me equally specious. The stringency of the clerk market has already been with us two or three years, is due entirely to other causes, and is gradually being overcome by the increased salaries which a decreased supply of clerks has called forth in accordance with economic law. Prerequisite legislation has had and will have no effect upon the situation save a salutary one. For let me ask what class of boys, if any, will increased entrance requirements keep out of the calling? Only the stupid and the ill-prepared ones. But are these the ones who have been leaving the drug business during the last year or two? You couldn't drive such boys away with a club, for they have no chances elsewhere; but even if they had gone and did go we should cry "good riddance" after them. No, the young men whom we have been losing are the bright and the fairly well prepared ones who have been disappointed with the conditions in pharmacy, and discouraged with the cheap and uneducated competition which they have had to face. These are the young men we want, and we can get them in no better or surer way than by improving the educational and professional character of the calling, and, therefore, both its dignity and its opportunities for financial success.

Among other cogent reasons, there are two in particular why we should insist upon the definite specification of suitable preliminary standards in all our graduation prerequisite laws. The first has already been mentioned in this address. I refer to the opportunity which the prerequisite movement presents of enabling the efficient and high-minded colleges to raise their entrance standards in a manner which the conditions of the past have practically rendered impossible. The one serious defect in our educational armor has been low standards of general education—not only *low* standards, but in the majority of instances almost no standards at all. Pharmaceutical education has made great strides during the last 25 years; college courses have been greatly extended, amplified and improved; but this progress, gratifying and necessary as it is, has been considerably nullified and defeated by this cancer which has so largely robbed the educational system of its strength.

You can't take a half-baked boy off the streets, with very little or no mental training, and teach him chemistry and botany and pharmacy and the rest. And yet this is the almost hopeless task which our colleges have been endeavoring to perform. The results? A Western Board of Pharmacy has found so many college graduates unable to do the simplest mathematical calculations which would be required of them daily in the store; it has found so large a number of candidates deplorably lacking in the fundamental knowledge really more vital and important than pharmaceutical learning, it has discovered graduates to have profited so little by their pharmaceutical courses for these reasons, that it has established a preliminary examination in the general branches which a candidate must first pass before he can come up for the pharmaceutical examination. Think of it! We must permit the water to rush through great holes in the dam above and then try to prevent the inevitable flood below by sweeping the water back with a broom!

We have now the chance to correct this condition of things and stop up the leak from which we have always suffered. It would be little less than folly of the most stupid sort not to grasp the opportunity and make the most of it.

The second reason why it is of such cardinal importance that our prerequisite laws should impose definite preliminary and also curriculum standards is because these will prove a safeguard against the rising of a horde of mendacious and mushroom schools which prerequisite legislation will call into being. Medicine suffered this crippling penalty as soon, thirty or forty years ago, as she began to make graduation from college compulsory ; and it has taken her nearly all of the intervening time to correct the mistake. The poorest and the most disreputable medical schools arose in great numbers in the leading cities of the country, and it was long before they were forced downwards out of existence or forced upwards into the paths of virtue. Why can't we profit by example ? Must we burn our own fingers before we find the stove to be hot ? An ounce of prevention is worth considerably more than a ton of cure—and it is applied a good deal more easily.

I am no extremist. I am no doctrinaire with head in the clouds. I am convinced of nothing more strongly than this, that we should neither go too fast nor too far in this new educational era upon which we are now entering, if we desire our progress to be sure and if we expect it to be permanent. But I certainly believe that we should insist upon at least one year of high school work as an entrance requirement in every graduation prerequisite law that we enact, with the clear understanding that in the years to come this standard is to be advanced just so fast, and only so fast, as the conditions permit and make necessary. If the Territory of Oklahoma can this year take a stand for a full high school course, it seems to me that one-fourth of that might be stood with equanimity by the states of the cultivated and aristocratic East! With a unanimity no less significant than satisfying, the standard of one year of high school work has been adopted in the prerequisite law of New York, in the prerequisite resolutions of Wisconsin, and likewise in the resolutions, already referred to, of the Ohio and Indiana boards of pharmacy. This standard is low enough. We should be ashamed to ask for less if we desire our graduation prerequisite laws to be possessed of any efficiency at all.

It may be argued by some fearful souls that we cannot secure this much from the legislatures, but it stands to reason that any legislature which would grant a college course would not strain over the gnat of so low a standard of preliminary education as one year of high school work. At any rate we should ask for it, and then submit to failure only when it becomes necessary to do so. If we attempt nothing we shall certainly gain nothing.

As for curriculum requirements, I believe they ought to be made equally specific, and I am convinced that we could not afford to establish lower standards than those imposed upon the members of the Conference of Faculties, namely, (1) 500 hours of lectures, (2) 600 hours of laboratory work, and (3) a course of study covering not less than 40 weeks. It is to be noted that the Ohio resolutions provide for two college years of not less than 26 weeks each, the Indiana resolutions for two years of not less than 26 weeks each, and the Wisconsin resolutions for two years of not less than 32 weeks each, the latter requirement exceeding the Conference standard by over 50 per cent.

In addition to prescribing definite entrance and curriculum standards there is one other thing needed of prerequisite laws. The acts of the various states must so far as possible be uniform in character if the best results are to be attained. As the United States grows more and more homogeneous, and becomes every year in reality more and more a single commonwealth instead of an aggregation of 45 separate and distinct ones, it is increasingly necessary that legislation be alike in the various states if the conditions are to be coped with successfully, and if unnecessary confusion and hardship are to be avoided. We are to discuss this morning a specimen prerequisite law which a special committee has been appointed to draft. Let us hope that the measure will prove eminently suitable for our purposes, as we have every reason to expect it will, and let us hope also that it will then be accepted as the standard by the various states in order that uniformity of legislation may be obtained.

In conclusion let me repeat that we have much reason to be proud and hopeful over what has been accomplished during the past year. It is clear that a new cycle of development has been entered upon, and it is equally clear that it promises much for the general betterment of the calling—as much, indeed, for financial and social and commercial betterment as for educational and professional improvement, for one set of results carries the other with it. But as we stand thus looking out upon a new path let us realize that while it leads on to better things there are pitfalls which we must avoid. Only a fool goes through the world with eyes shut. Let us keep ours open.

The Chairman's Address was received with hearty demonstrations of approval, and, on motion of Mr. Eberle, of Texas, was ordered referred to the Committee on Publication.

Mr. Oldberg gave it as his opinion that what the Chairman had said on the subject of preliminary education before admission to college was absolutely true, and it was important for the Association to know that the preliminary educational requirement before admission to the colleges of pharmacy was too low. Members of the Board of Pharmacy in Illinois had had that experience in examining applicants for registration, and had published statements in the pharmaceutical journals to that effect. The greatest discredit to pharmaceutical education in the country was the low standard of general education tolerated.

Mr. Hallberg said that when the educational-requirement feature was adopted in Illinois, it was never intended that the Board of Pharmacy should constitute itself a committee on high-school examination, and it was not done for five years thereafter. School certificates were accepted, and that was the rule of the Board until in more recent years, when the Board took it upon itself to examine even high-school graduates for the preliminary requirement. In his opinion, no Board of Pharmacy constituted as the Illinois Board is is competent to examine in branches of this kind, and a great many of the questions propounded to young men coming from the high schools—and even grammar-school graduates—are not designed to draw out whether they have a proper education or not. The Boards should require the certificate of the school, and in the absence of such certificate they should examine for the preliminary educational requirement.

Mr. Mason resumed the chair.

After some announcements had been made by the Chair, Secretary Cliffe was called on to make his report, and he did so in abstract, the following being the full text of his report:

REPORT ON LEGISLATION.

CALIFORNIA.

Passed: An act to regulate the practice of pharmacy in the State of California, approved March 20, 1905. This was the re-enactment of a remodeled Pharmacy Law, repealing all laws that conflicted, and became operative on July 1, 1905.

Passed: An act regulating the employment of drug clerks by limiting the hours of service to an average of sixty hours in a week of six consecutive calendar days, with a

penalty clause imposing fine and imprisonment, either or both, at the discretion of the court, but exempting "the answering and attending to emergency calls."

Passed: An addition to the penal code known as number 347a, regulating the sale of poisons and giving list of articles coming under the provisions of the act.

CONNECTICUT.

Passed: A bill regulating the sale of cocaine and its salts by prohibiting all sales except upon proper prescriptions, which cannot be renewed and has to be retained as a voucher.

Passed: An act amending Section 4734 of the General Statutes by adding to Schedule A attached to same, "wood or methyl alcohol, under any name or in any mixture." This makes it legally a poison, and subjects it to the requirements governing the sale of other virulent poisons.

Not Passed: A bill requiring proprietary remedies to bear labels giving the percentage of alcohol, opium or cocaine in their composition.

INDIANA.

Not Passed: A proposed poison law that was decidedly objectionable to the pharmacists of the State, and was strongly and successfully opposed by them.

ILLINOIS.

Not Passed: A bill amending the Pharmacy Law, making it unlawful for any one not a registered pharmacist to sell patent or proprietary remedies.

Not Passed: A bill amending the law regulating the sale of cocaine, lowering the fine and adding imprisonment of from ten days to six months.

Not Passed: A bill providing for changes in the penalty of the cocaine law and keeping a record of prescriptions for cocaine, opium, morphine, etc., and excepting from the provisions of the act "preparations containing not more than six grains of opium or not more than one-half grain of morphine in one fluidounce, or if a solid preparation, in one avoirdupois ounce, when there is affixed upon each bottle, box, vessel or package containing the same specific directions for use and a caution against habitual use."

LOUISIANA.

Passed: An act to amend and re-enact section number 2 of act number 66 of the session of 1888 (the pharmacy act), providing that hereafter all applicants for both grades of certificates should pass an examination before the Board, and that diplomas would not be recognized in lieu of an examination.

Provision is made for the registration of apprentices, and specifically a qualified assistant is allowed to act as temporary manager of a pharmacy and assume charge thereof for not more than 24 consecutive hours during the absence of the registered manager.

MAINE.

Passed: A bill known as the "Sturgis enactment" which provides for taking the enforcement of the liquor laws out of the hands of local authorities and placing it in the hands of the commission. The result has been the cancellation of large numbers of licenses held by druggists.

Not Passed: A bill regulating and placing the sale of spirituous and malt liquors in the hands of the druggists.

MASSACHUSETTS.

Passed: A bill providing for the labelling of wood alcohol as a poison "in black letters of uncondensed gothic type of not less than one-fourth of an inch in height," and also prohibiting the sale or exchange of any article of food or drink or any drug intended for internal use, containing wood or methyl alcohol.

Passed: A bill reducing the minimum penalty for the adulteration and substitution of drugs from $100 to $25.

Not Passed: Several bills designed to compel labelling to show ingredients of preparations containing alcohol and narcotic drugs.

Not Passed: A bill compelling the granting of liquor licenses of the sixth class to druggists without the concurrence of the Pharmacy Board.

Not Passed: A bill providing for the publication upon the package of proprietary remedies the formula of ingredients, and analysis by the State Board of Health to insure conformity.

Not Passed: A bill introduced upon the petition of Walter E. Nicholls for legislation to enable registered pharmacists to procure employment. The title is misleading as the real intent of the bill was to enable a registered pharmacist to manage a pharmacy with the same rights and privileges as to liquor licenses as a registered pharmacist doing business on his own account—the present law compelling the ownership of at least a $500 interest to secure a sixth class license.

MICHIGAN.

Passed: A bill drawn after the model pharmacy law adopted by this Association was introduced but on account of dissension between the State Board and the State Association had to be submitted to a conference, the result of which was a substitute which embodied essentially the features of the original bill. It contained a prerequisite clause based upon preliminary education without requiring graduation.

Not Passed: A bill was introduced to regulate the sale of patent and proprietary remedies by requiring in each case that the formula be plainly printed in English upon the label.

Not Passed: A drug-clerk bill was introduced which has been stated to have been of a revolutionary character.

MINNESOTA.

Passed: A prohibitive cocaine bill requiring a physician's prescription for the sale of cocaine or its preparations.

Passed: A bill prescribing the labelling of wood alcohol as "Wood Naphtha, Poison," denominating also the size and style of container in which it may be sold.

Passed: A bill to prevent the careless distribution of medicines, drugs and medical compounds, designed evidently to prevent sampling.

Not Passed: An itinerant vendor's act which was designed to abolish the business by imposing a heavy license tax.

Not Passed: A bill requiring apprentices in pharmacy to register as such, as a means of determining officially the term of experience.

Not Passed: A bill requiring all vendors of proprietary remedies containing more than twenty per cent. of alcohol to take out a retail liquor-dealer's license.

Not Passed: A bill known as the "Stock Bill," requiring all candidates for registered pharmacist's certificates to have had at least two years' training in a reputable college or school of pharmacy.

Not Passed: A bill requiring the State Board to register all applicants for R. P. certificates having a diploma from a school of pharmacy without examination.

Not Passed: A bill requiring all preparations containing opium, laudanum, morphine or codeine to be so labeled with the contained amount.

MISSOURI.

Passed: A stringent anti-cocaine law became effective May 16, 1905, which prohibited sales except upon the prescription of a physician or dentist, and allows no renewals.

Passed: A bill was introduced providing for the registration of all sales of preparations containing over twenty per cent. of alcohol; this was amended so as to apply only to wines and liquors and passed.

Not Passed: A bill providing for annual re-registration with a fee of one dollar, the

placing of the pharmacist's registration number upon prescription labels, and prescribing the salaries to be paid to the officers of the State Board.

NEW YORK.

Passed: A bill providing for the exemption of college property from taxation. This was a general bill with certain beneficent features for a certain institution.

Passed: A bill to amend the penal code relating to crimes against the public health and safety which adjusted differences between the code and the pharmacy law relating to the sale of poisons. It prohibits and penalizes substitution and wilful negligence and ignorance in the handling and sale of poisons and schedules poisons by name into two classes and prescribes method of selling and labelling.

Passed: A bill repealing the privilege to druggists of paying a small liquor-license fee and placing a special ten-cent revenue stamp upon each package of liquor sold in quantity of a pint or less.

Passed: A bill became effective September 1, 1905, prohibiting the use of wood alcohol in foodstuffs, liquors or beverages.

Not Passed: A bill known as the "Grady Bill" to prevent the adulteration and misbranding of drugs and medicines was killed in committee.

Not Passed: A bill known as the "Platt Formula Bill" providing for the registration of all formulæ with the State Commissioner of Health and payment of a fee upon the issuance of a permit to manufacture was killed in committee.

Not Passed: A bill providing for the registration of all sales of wood alcohol and the payment of one-third of the amount received as a tax to the state.

Not Passed: A bill to prohibit the sale of cocaine or its salts or any admixture thereof at retail except upon prescription which could be filled but once.

NEW HAMPSHIRE.

Passed: A new liquor-license law became effective in May, raising the fifth-class license fee from $10 to a minimum of $50, and providing that as much as $500 can be charged at the option of the commissioners.

Not Passed: A bill requiring the formula to be printed upon the outside wrapper of all proprietary medicines.

Not Passed: A bill prohibiting the sale of Essence or Extract of Jamaica Ginger containing over ten per cent. of alcohol.

NORTH CAROLINA.

Passed: An enactment "to revise, consolidate and amend the Pharmacy Law." It provides for reciprocity in certificates with such boards having requirements equal to those of North Carolina, provided the certificate was obtained by examination. The minimum of practical experience is two years where the applicant has had college training, otherwise three years; and the applicant has to be at least eighteen years old.

Provision is made for the revocation of certificates (licenses) in cases of felony or gross immorality or addiction to alcohol or narcotics, while power is given to refuse certificates in similar cases.

Physicians are permitted to operate stores without submitting to examination in towns of 600 or less.

It is made unlawful for any person not legally licensed as a pharmacist "to take, use or exhibit the title of pharmacist or licensed or registered pharmacist, or the title druggist or apothecary, or any other title, name or description of like import."

Pharmacists legally become the custodians of prescriptions by a requirement making it obligatory to file for at least five years and to furnish a true and correct copy to either prescriber or patient upon request.

Passed: An act to regulate the sale of cocaine, opium and morphine. The act re-

stricts retail sale to physician's prescription which cannot be refilled except in case of emergency and in the absence of a physician. There is also complete nullification of the provisions of the act by specifically excepting "sales of laudanum and paregoric, or other preparation containing not more than thirty per cent. of cocaine, morphine or opium."

NORTH DAKOTA.

Passed: On and after July 1st, 1905, there is in effect an extremely radical law of the New Zealand type. It provides for labelling with the correct formula all medicines and remedies, proprietary or otherwise, except physicians' prescriptions. Exact percentages must be shown in case the remedy contains chloral, ergot, morphine, opium or any compound or derivative of these; cocaine or its salts; bromine, iodine or any of their salts, and the printing must be in black open gothic letters upon a white background.

Penalties are from $5 to $100 for first violation with cost of action and analysis added and confiscation of goods. The administration of the law is in the hands of the Dairy and Food Commission.

OHIO.

Passed: On petition of the Ohio Valley Retail Druggists' Association the Municipal council of Cincinnati passed an ordinance prohibiting the sale of carbolic acid except upon the prescription of a physician or upon the request of two adult persons made in the presence of each other, both of whom certify to its proper use; and except it is sold in the form of a five per cent. solution containing ten per cent. of alcohol.

PENNSYLVANIA.

Passed: A bill of the prerequisite class requiring that on and after January 1st, 1906, all applicants for certificates of the Registered Pharmacist class shall be graduates of a reputable and properly chartered college or school of pharmacy.

Passed: A "Soda-Syrup Bill" specifically prohibiting the use of about all known preservatives and anti-ferments, as well as coal-tar dyes, sulphate of copper and other coloring matter injurious to health. As benzoic acid and benzoates are not specifically prohibited, it is assumed that their use is permissible, as well as harmless vegetable coloring.

Not Passed: A bill to prohibit the sale of any patent or proprietary medicine or remedy intended for internal use or medication containing alcohol, except upon the prescription of a properly qualified physician.

TENNESSEE.

Passed: A bill empowering the Grand Jury to take initial action against the adulteration of drugs, thus superseding the power of the State Pharmacy Board.

Not Passed: A bill authorizing the State Board to grant registration as pharmacists, without examination, to all applicants presenting evidence of having had five years' experience.

Not Passed: A bill requiring all members of the State Board of Pharmacy to be graduates of a college of pharmacy.

Not Passed: A bill prohibiting the sale of any medium capable of producing intoxication within four miles of a court house or school house except upon the prescription of a physician.

TEXAS.

Not Passed: A bill providing that every medicinal compound be sold under a label giving formula, and prohibiting the sale of all preparations containing two per cent. of opium, or an eighth grain of morphine to fluid ounce, or over, except upon a physician's prescription.

WISCONSIN.

Passed: A bill known as the "Dahl Liquor Bill." It provides that each purchaser o

liquor from a druggist must make affidavit that it is for medicinal use. A record of sale with affidavit attached must be filed by the druggist with the clerk of the city or village where his business is located.

The penalty is revocation of the pharmacist's license.

Not Passed: A bill providing for the printing in English upon the label of every package of patent or proprietary remedy, of the true formula.

W. L. CLIFFE,
Secretary.

REGISTRATION STATISTICS, 1904–1905.

	Total on Rolls.		Registered During Year by Examination.		Registered During Year Without Examination.					
	R. P.	R. A. P.	R. P.	R. A. P.	As Graduates in Pharmacy.	As Graduates in Medicine.	For Other Reasons.	Assistant Pharmacists.	Graduates on Roll.	Women on Roll.
Alabama.	1254	.....	48	.....	3	10	3		.....	
Arizona	141	3	.....	.....	.....	.....	.....	.....	.....	4
Arkansas.	707	.....	35	.....	19	.....	1			
California	†*2761	811								
Colorado.	†*800	52								
Connecticut	996	.....	77	.....	.....	.....	.....	.....	.....	12
Delaware	296	51	5	2	28	9	.....	.....	100	3
District of Columbia	1042	.....	9	.....	36	.....	.....	.....	562	9
Florida.	1038	.....	35	.....	4	11	9	.....	220	10
Georgia	1600	.....	130	.....	.....	4	.....	.....	.....	7
Idaho	†3830	15								
Illinois.	†4875	903	.....	.....	.....	.....	.....	.....	.....	123
Indian Territory	695	.....	34	.....	100	.....	.....	.....	.....	14
Indiana	3396	368	52	50						
Iowa.	†3830	15								
Kansas.	1565	36								
Kentucky	1770	.....	58							
Louisiana	858	109	27	27	.....	.....	3	.....	.....	15
Maine	†642	16								
Maryland	1032	214	16	11	.....	.....	.....	.....	.....	64
Massachusetts	4473	.....	124	.....	.....	.....	.....	.....	.....	10
Michigan.	3377	395	131	123						
Minnesota	†1442	211								
Mississippi.	1183	.....	52	.....	.....	.....	.....	.....	92	7
Missouri	15900	.....	42	.....	107					
Montana	235	25	20	5	.....	.....	.....	.....	.....	5
Nebraska	1525	.....	72							
Nevada	84	.....	.....	.....	3	.....	.....	.....	8	
New Hampshire	742	116	18	8	.....	.....	.....	.....	.....	3
New Jersey	1895	79	104	33	.....	.....	.....	.....	.....	20
New Mexico	147	.....	7	.....	20	.....	.....	.....	.....	2
New York	13491	544								
North Carolina	700	.....	64	.....	.....	7	.....	.....	50	3
North Dakota	†400	†129								
Ohio.	3472	611	126	72	.....	.....	7			
Oklahoma	538	.....	46	.....	34	.....	.....	.....	90	9
Oregon.	633	66	57	18	.....	.....	1	.....	3950	82
Pennsylvania.	7200	3950	404	238						
Rhode Island.	297	182	2	17	.....	.....	.....	.....	.....	6
South Carolina	*450	.....	4	.....	44	.....	.....	.....	.....	3
South Dakota	610	24	31	.....	.....	.....	6	.....	223	11
Tennessee	1184	128	29	17	.....	.....	.....	11	.....	28
Texas	†1590									
Utah.	†*2811	†45								
Vermont	354	.....	14	.....	.....	.....	.....	.....	354	3
Virginia	849	87	20	14	.....	9	77	.....	.....	5
Washington	†625	†50								
West Virginia	1485	.....	39	.....	20					
Wisconsin.	1539	412	65	53	.....	.....	.....	.....	.....	46
Wyoming.										

* Estimated. † Figures given last year; no report for this.

On motion of Mr. Lowe, of Philadelphia, the report was ordered received and referred to the Publication Committee.

The Chair stated that Mr. E. G. Eberle, of Texas, had prepared a paper supplementary to the Secretary's report, but inasmuch as it was a supplement, and discussed at a little more length the subject of anti-narcotic laws, Mr. Eberle had agreed that it would be best to submit the paper in printed form and let it be referred, and so he would entertain a motion to read by title and refer. On motion of Mr. Mayo, it was so ordered.

The following is the text of said paper:

THE ANTI-NARCOTIC LEGISLATION OF THE YEAR.

BY E. G. EBERLE.

North Carolina, Minnesota, Missouri, Connecticut and Texas have this year passed anti-narcotic laws.

The North Carolina law would find no consideration in this resumé if it was not such a striking example of what a legislature can bring forth in the way of curiosities. It first makes provisions, using about the usual verbiage, to prohibit indiscriminate sales; and then it lays down the following exceptions: "Except in cases of emergency," "in the absence of a physician," and "laudanum, paregoric, and any preparation containing not more than thirty per cent. of cocaine, morphine or opium."

The Minnesota law relates only to the sale of cocaine and its salts or compounds thereof. It permits the sale only on the prescription of a licensed physician or dentist, which prescription is not to be refilled, must bear the name and address of the patient, and be preserved by the pharmacist compounding it. Sales are permitted by wholesale and retail druggists, licensed physicians, or dentists, in original packages. Prescribing for habitues and selling other than by prescription is made punishable by fine or imprisonment, or by both, and by revocation of the druggist's license. The county attorney shall prosecute cases on complaint, and he is authorized to examine the books of wholesaler or manufacturer to trace violations.

This Minnesota law, if my judgment is correct, may be considered prohibitory, so far as sales are concerned otherwise than by prescription. Whether such legislation is desirable is a matter that has not been satisfactorily settled in my mind, but if there is any habit-forming drug entitled to such legislation, it is beyond question cocaine. As human beings we are liable to err. Some may violate laws of this kind who would observe laws violated by others, and taking that as a criterion, I believe that the Minnesota law is too stringent in the penalty imposed, which should rather be scaled in accordance with the offense. The severest penalty is inflicted with the first violation, namely, the revoking of the license to practice, making it necessary for the offender to transfer or to sell his business, and perhaps bring ruin upon him financially and socially for what may not have been so grave a transgression after all. If the punishment were

scaled, and the revoking of the license made the penalty for the third offense, say, it would in my judgment be a better law. We can all be tempted through sympathy, and there are blackmailers in every community.

The Missouri law, like the Minnesota statute, concerns the sale of cocaine only. It is deficient in that it permits sales at wholesale by any manufacturer or wholesale dealer without the necessity of designating to whom the sales can be made. It therefore simply transfers the sales from the retail dealer to the wholesalers, which fact might induce some druggist to go into the wholesale or manufacturing business.

The Connecticut law affects cocaine and eucaine, and the salts and preparations thereof, and permits the sale only on prescription or order of a lawfully authorized practitioner of medicine or veterinary medicine, sales by jobbers, wholesalers and manufacturers to retail druggists, and sales by retail druggists to physicians, dentists, veterinarians, hospitals, colleges and scientific or public institutions. I do not think the bill was intended to prevent sales by jobbers and manufacturers to hospitals, colleges, scientific or public institutions, but construed literally it does this very thing. The law only regulates the sales of narcotics by druggists without seeking to regulate the prescribing of them by physicians, which in many localities, even where laws exist, is the resort of the habitue and a source of revenue to a few physicians who stoop to such practice. Some of the remarks made relative to other laws and bills in the foregoing apply to this one also.

The Texas law relates to the sale or giving away of cocaine, morphine, opium, chloral and preparations thereof, and is practically a duplication of the Beal model with the exception that the latter exempts the preparations for diarrhœa or cholera containing opium, while the former does not specifically name opium; the Texas act also exempts patent or proprietary medicines containing the prescribed drugs if they are not compounded or sold for the purpose of evading the act. Both of these points are bad features, and that with reference to proprietary articles could have been obviated by increasing the permitted quantity of opium and morphine to three times the amount in the Beal model. I refer to these features of the Texas act as objectionable because a person may compound cholera or diarrhœa remedies, or proprietary or patent medicines, which do not on their face evade the act, but which as a matter of fact will not only satisfy the habitual user of narcotics, but will make habitues and thereby build up a sale for such preparations. I have in mind a preparation of extensive sale that was not at first made for a beverage; neither the label nor the advertisements indicate any such use for it; however, the unlimited sale of the preparation shows that it is not used exclusively as a medicine.

In addition to the foregoing new laws, anti-narcotic bills were introduced this year in the legislatures of New York, Rhode Island and Illinois. The

New York bill resembles to some extent the Missouri law, and was open to the same objections. The Rhode Island draft was opposed by some representative druggists and did not pass, evidently for good and sufficient reasons. No one knows the contentions which arise in legislative bodies unless taught by actual experience. The Illinois bill was framed after the Beal model, with increased restricted quantity of morphine and opium that could be sold without a prescription, namely, one-half grain of the former and six grains of the latter in a fluid or avoirdupois ounce. The bill throughout strikes me as being a good one aside from the penalty, which is that for second offense the license shall be revoked. My understanding is that the druggists of Illinois, before enacting a law, thought best to come to some agreement relative to a bill that would meet with general approval. The contentions were over the drugs to be restricted and the quantity that could be sold without a prescription.

Narcotic legislation is necessary not only for the protection of the public, but also to uphold the character of our profession. The indiscriminate sales by a few will surely taint the profession as a whole. Legislation in no direction will absolutely prevent transgressions, and we can only hope to lessen them, and then only by watchfulness. Fine and imprisonment should only be cautionary measures, and imposed in the first and second offenses respectively, while if the offender persists in violations, his license as a druggist should be revoked. Boards of pharmacy should be charged with the enforcement of this as well as all pharmaceutical legislation, and part, if not all, the assessed fines should go to their treasury in order to meet the increased expenses. A law not observed, and without any effort being made to enforce it, is worse than useless.

I believe that greater stress should be laid upon the moral qualifications of those who seek to enter the profession and of those who compose the examining boards. Can a licentiate have any respect for the profession if he enters it through favoritism or other undue influence? Can we expect him to let his conscience dictate to him the proper course to pursue in his transactions with the public? The indiscriminate sale of narcotics is not the only condemnatory act he may commit nor the only harm he may do the profession. This applies with equal force to the medical fraternity. Physicians may say we are to blame for the increase of the drug habits we are contending with, but they cannot deny that they laid the foundation and are daily adding others to the many victims who will hereafter appeal to the druggist under various pretences and even with prescriptions for the proscribed drugs. The laws should be as outspoken with restrictions for the physician as for the druggist; it will fit him as well, or nearly so, as the pharmacist. Who is asking for legislation to mitigate the narcotic evil? As far as I know the medical profession is silent in legislative halls.

The restricted drugs should be confined to the fewest number possible, and I believe the designated quantities to be sold without a prescription

in the Beal model could be increased four times, provided that such sales were only made by registered pharmacists to known adults, and that a record were kept for legal inspection, giving the date, amount and name of drug sold, name of purchaser, and the purpose for which it is sold. Such sales should not be made to or for habitues, and the vendor should become subject to the penalties provided in the Beal model and have his license revoked for persistent violation. A written notice by a member of the family, guardian or next friend not to sell to the person named in the notice should have legal force, and non-acquiescence in such notice should make the vendor not only responsible for violation of the law, but also liable for damages.

Good anti-narcotic legislation places the violator on a very low plane, and soon causes his store and customers to be understood in its real character, even if it does not entirely prevent illegal sales. It will be an exceedingly difficult matter to redeem the lower classes from this affliction, but, handicapped by the law, the vendor must use some precaution or he will find himself in court through the efforts of societies working among these unfortunates, if not at the instigation of the druggists or the officers of the law. To this extent at least anti-narcotic legislation has done good: it has diverted sales to such an extent that one can almost point out the stores in which narcotics are sold in violation of the law. It has given some who acquired the habit an opportunity to see how his kind are regarded; perhaps other possible victims are made to see the danger which confronts them if they persist in taking an opiate every time an imaginary or real pain strikes them; and possibly the practitioners of medicine have been brought to realize the woe, the crime and the misfortune for which they are in part to blame.

Mr. Geo. F. Payne, of Atlanta, in connection with the Secretary's report, related a recent experience of his own with a bill, the counterpart of which comes up every year, in the Georgia Legislature, in regard to printing the formula of remedies on the bottle containing them. At request of the pharmacists of the State, he went before the Legislature and fought this bill and defeated it. The bill was referred to a commitee on hygiene and sanitation. The committee had nineteen doctors on it, and of course they were in favor of having the formula published. He went before them and made the argument that they were constantly prescribing proprietary remedies of which they did not know the composition, and asked them if they would agree to have the formulas of such appear on their prescriptions—that what was sauce for the goose was sauce for the gander—and they admitted the force of the argument and said they would amend the bill. But they never pushed the bill, and, of course, did not put in the amendment. Mr. Payne said he would like to hear an expression from the pharmacists of the country on this line.

Mr. Ebert stated that in the report of the Committee on National Legis-

lation there was a recommendation that State legislation be considered by that committee as well as National, and this case and the report of the Secretary showed the importance of it. In his judgment, the American Pharmaceutical Association could not do a better thing than to empower the Committee on National Legislation to aid the states where such vicious legislation was attempted to be forced on them. He went to North Dakota when the bill referred to by the Secretary came up, and helped to make the fight on it. The execution of the proposed law was not to be in the hands of the Board of Pharmacy, but with the Agricultural Department of North Dakota, and the pharmacists of that State are in the hands of that department to-day.

At request of the Chair, Mr. Beal then presented the following as the report of the Special Committee on a Model Prerequisite Law.

REPORT OF THE COMMITTEE ON FORM OF LAW REQUIRING GRADUATION FROM A COLLEGE OF PHARMACY BEFORE REGISTRATION.

Under a republican form of government, the greatest danger that can come to any reform is to acquire legislative sanction before it has received the sanction of public opinion, upon which it must depend for its continuance and enforcement.

Human institutions, both legal and of custom and opinion, are not like buildings which can be torn away and restored *de novo*, and hence changes and reform in either, to be permanent, must be made to fit into the pre-existing structure without greatly disturbing prevailing sentiment or routine.

That the nature of the pharmacist's employment is such that public safety demands that no one should be admitted thereto without preliminary training afforded by a reputable college of pharmacy there is perhaps no difference of opinion among those who have given the subject sufficient consideration. That the college course should be preceded by a general literary education at least equivalent to a first-class high school course is likewise generally assented to. The only difference of opinion is as to the manner in which these reforms are to be brought about and the time when they shall take effect.

Instead of fixing a definite amount of preliminary literary training, the present draft leaves it to the pharmacy boards to adopt such a standard as may seem to them sufficient and feasible of enforcement.

That these boards will be as exacting in this respect as the circumstances of the case will warrant is fully demonstrated by current history. Given the power to enforce proper preliminary training, there is no doubt but that the boards will quite generally raise the standard to as high a point as seems to them expedient, and of this expediency the boards are in a better position to judge than any other authority.

These principles, as they are understood by the Committee, have keen kept in mind in the preparation of the draft which is hereby respectfully submitted.

J. H. Beal,
J. A. Koch.

Be it enacted by the General Assembly of the State of ..... that Section ..... (of the act regulating the Practice of Pharmacy) be amended so as to read as follows:

Section 1. In order to be licensed as a pharmacist within the meaning of this act an applicant shall be not less than 21 years of age, and shall have been licensed as an assistant pharmacist for not less than two years prior to his application for license as a pharmacist, and he shall present to the Board of Pharmacy satisfactory evidence that he is a graduate of an incorporated school or college of pharmacy or a department of pharmacy of a University which shall possess a satisfactory equipment for giving instruction in the art and science of pharmacy, and which shall enforce such requirements for admission and gradua-

tion as shall be satisfactory to the Board of Pharmacy, and that he has had four years' experience in pharmacy under the instruction of a licensed pharmacist; and he shall also pass a satisfactory examination by or under the direction of the Board of Pharmacy.

Provided, however, that the actual time of attendance at a college of pharmacy or department of pharmacy of a university approved by the Board of Pharmacy shall be deducted from the time of experience required, but in no case shall less than two years' experience be required for registration as a licensed pharmacist.

SECTION 2. That sections ..... (of the act regulating the practice of pharmacy) be and the same are hereby repealed.

SECTION 3. This act shall take effect and be in force from and after .....

Mr. Beal, in connection with his report, said he had omitted to state that, in his opinion, if this report was adopted, the Association should make very definite its sense of what it believed to be a sufficient preliminary educational requirement to be enforced by the Board of Pharmacy. That would place the Association squarely on record, and would give the Boards a standard to measure by. If a standard is fixed, then the Boards can raise it according to particular circumstances, and a law which would admit of automatic regulation in this way would be much better than one which fixed a hard-and-fast standard, which could only be raised by an assumption of power on the part of the officer exercising it that he did not possess. While he did not offer it for passage at this time, he thought some such resolution as the following should be ultimately adopted :

Resolved, That it is the sense of the Section on Education and Legislation, that when graduation from a college of pharmacy is made a prerequisite to registration, Boards of Pharmacy should require from such colleges as are recognized as reputable the enforcement of a requirement for entrance to such colleges a preliminary general education which at least shall be the equivalent of the first year in a standard high school, and that the Board shall, as rapidly as conditions will permit, raise the requirement to that of graduation from a standard high school.

The reading of the resolution was greeted with applause.

The Chair called for action on the report of the Special Committee as read, and Mr. Hallberg, seconded by Mr. Cohn, moved to adopt.

After a discussion of some length, participated in by Messrs. Oldberg, Anderson, Beal, Sheppard, Eliel, Payne, Cliffe, Roehrig, Bartley, Eccles, Hancock, Whelpley, Hallberg and Hynson, during which several motions and countermotions were made and considerable wrangling developed, the Chair declared that, while admittedly not a parliamentarian, it appeared to him there was only one real question before the body, and that was as to whether Mr. Hallberg's motion to adopt the report of the committee as read, should be adopted, it being understood that the resolutions offered by Mr. Beal were incorporated and formed a part of the report.

And the motion was so put and carried, with applause.

The Chair then called for nominations for officers of the Section for the ensuing year, and Mr. Lowe nominated Mr. W. L. Cliffe, of Philadelphia, for Chairman, but Mr. Cliffe declined on the score that he had engagements ahead for some time to come that made it impossible for him to

accept. Mr. Hallberg then nominated Mr. Oscar Oldberg, of Chicago, for Chairman, and Mr. Lowe nominated Mr. Joseph W. England, of Philadelphia, for the same office. Mr. Wilbert also put Mr. England in nomination for Secretary.

Mr. Hallberg nominated Mr. Geo. C. Dieckman, of New York, for Secretary, but the gentleman said he could not possibly serve.

On motion of Mr. Hallberg, the Section then adjourned.

SECOND SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 6, 1905.

The second session of the Section on Education and Legislation was called to order at 3 : 20 p. m., with only a moderate attendance.

On motion of Mr. Wilbert, the reading of the minutes of the first session was dispensed with.

Chairman Mason announced that the next order of business was the election of officers, and called for further nominations, stating that the nominations for Chairman at the first session were Mr. Oscar Oldberg, of Chicago, and Mr. Joseph W. England, of Philadelphia. Mr. Anderson moved that nominations be closed. Mr. England withdrew his name for Chairman, and Mr. Hallberg moved that the Secretary cast the affirmative ballot of the Section electing Mr. Oldberg Chairman. This motion was carried, the Secretary stated that he had cast the ballot as directed, and the Chair declared Mr. Oldberg duly elected Chairman of this Section for the ensuing year.

The Chair stated that Mr. England had also been nominated for Secretary at the first session, and his name was still before the house for that office. He called for further nominations, and Mr. Eccles nominated Mr. Charles Holzhauer, of New Jersey, but the gentleman said he would not be able to perform the duties of the office and withdrew his name. Thereupon, on motion of Mr. Chas. Caspari, Jr., nominations were closed and the Secretary ordered to cast the ballot of the Section electing Mr. England as Secretary. That officer stated that he had performed that duty, and the Chair declared Mr. England duly elected, to serve for the ensuing year.

The Chair stated that the next order of business was an interesting series of papers and a committee report on the general subject of pharmaceutical degrees. The special committee on this subject was called on to report, and Mr. Chas. Caspari, Jr., Chairman, presented the following majority report from the joint committee of this Section and the Conference of Pharmaceutical faculties :

REPORT OF JOINT COMMITTEE ON PHARMACEUTICAL DEGREES.

The joint committee appointed by the Chairman of the Section on Pharmaceutical Education and Legislation of the A. Ph. A. and the President of the American Conference of Pharmaceutical Faculties beg leave to present the following majority report for

discussion and action at the meeting to be held at Atlantic City, N. J., September, 1905:

It is recommended that the degree of graduate in pharmacy (Ph. G.) be granted by colleges that comply with the minimum requirements adopted by the Conference of Pharmaceutical Faculties at its last session, September 8, 1904.

The requirements are as follows:

a. The institution shall be incorporated as a college or school of pharmacy, or be a department of a regularly incorporated educational institution, or a department of a state university, or conducted by an incorporated pharmaceutical society.

b. The institution shall include in its courses of instruction oral lectures, personal laboratory work, recitations and reviews. This shall exclude work in absentia.

c. The institution shall require of each candidate for graduation not less than 500 hours given to lectures and recitations, and not less than 600 hours of laboratory work; such work to be given in a period of not less than forty weeks.

d. The requirements for admission of students to the school or college shall be, (1) a minimum age of 17 years; (2) a common school education entitling the student to enter a high school, unless the candidate is a high school graduate or possesses an equivalent education.

It is also recommended that the degree of pharmaceutical chemist (Ph. C.) be granted on the following conditions:

1. The college desiring to confer the degree should require, as a minimum for entrance, 2 years of completed work in a high school, or its equivalent.

2. College work to consist of at least 750 hours of lectures and recitations, and 900 hours of laboratory work.

It is further recommended that all bachelors', masters' and doctors' degrees in pharmacy be not granted except for work corresponding to that required for similar academic or university degrees.

For the committee, CHAS. CASPARI, JR., *Chairman.*

KANSAS CITY, MO., *September, 1904.*

The Chair suggested that as there were several papers to be presented before any definite action should be taken on the report, perhaps it would be better to defer action until they were presented.

Mr. Hynson said he had a resolution he wanted to offer as a substitute for the recommendation of the committee. The Chair suggested that this matter be postponed also for the present, in view of the postponement of Mr. Kremers' motion, until the papers referred to could be read and the Section could get its bearings and know just what it wanted to do; but Mr. Hynson thought the resolution might be read at this time anyhow, and laid on the table, and action taken later. He then read the following:

Resolved, That this Section recommends to the pharmaceutical schools of America, and requests the general Association and the American Conference of Pharmaceutical Faculties to recommend to the same, that, after the year 1906, they establish a uniform three-year course, upon the successful conclusion of which they confer the doctorate degree, with the title of Doctor of Pharmacy; and if it is deemed necessary or desirable for some colleges to continue a second, or two-year course, that the degree of Graduate of Pharmacy be conferred upon its successful conclusion, and also that this two-year course be abandoned as quickly as conditions will permit.

Mr. Kremers, in order to facilitate matters, moved that the resolution

just read be laid on the table for the time being and taken up later, and it was so ordered.

The Chair then called on Mr. J. T. McGill, a member of the special committee an pharmaceutical degrees, to read a short paper supplementary to the committee's report. Mr. McGill presented the paper in abstract, the following being its full text:

COLLEGE OF PHARMACY DEGREES.

BY J. T. M'GILL.

The two committees on College of Pharmacy Degrees, appointed at the meeting of the American Pharmaceutical Association at Kansas City in 1904, the one by the Section on Education and Legislation, the other by the Conference of Pharmaceutical Faculties, met in joint session and adopted the following resolutions to be presented as recommendations at the meeting of the Association to be held at Atlantic City in 1905.

1. The degree of graduate in pharmacy (Ph. G.) should be conferred for the course of study for which the minimum requirements were prescribed by the Conference of Pharmaceutical Faculties at the meeting of September 8th, 1904.

2. The degree of pharmaceutical chemist (Ph. C.) should be conferred for a longer course of study with minimum requirements to be prescribed by the Conference of Pharmaceutical Faculties.

3. The degrees of bachelor of pharmacy (Phar. B.), master of pharmacy (Phar. M.), and doctor of pharmacy (Phar. D.) should not be conferred unless with requirements equivalent to those for the corresponding college and university degrees.

As a member of one of the committees making these recommendations, I wish to say something in their support. What I shall say will be mainly on the third recommendation, and principally in reply to the arguments which have appeared in pharmaceutical journals, which oppose conferring the doctor's degree for special high requirements, and favor using it as the one and only degree for the ordinary course in schools of pharmacy.

First I shall discuss the question of the propriety of using the bachelor's, master's and doctor's degrees in pharmacy under the restrictions named. Secondly, I shall try to answer the objections brought against their use in this way. Thirdly, I shall reply to what has been said in favor of granting the doctor's degree as the one and only degree for the ordinary course in pharmacy. These divisions will not stand out with entire distinctness, for the discussion of one part of the subject naturally includes incidentally some things applicable to another part.

For several centuries these degrees have been used in universities to indicate the completion of certain prescribed courses of study ranging in extent from that of bachelor, the shortest, to that of doctor, the longest. The courses of study have been taken in any of the four departments known as law, medicine, theology, and arts, the last including philosophy, science and literature. In the department of arts the degrees have all

been and are now in common use. In the other departments the master's degree is now rarely conferred; and in some schools only one degree is granted, generally that of bachelor in schools of law and theology, doctor in schools of medicine. The gradation, however, from bachelor, the lowest, to doctor, the highest, is almost universally adopted; and the propriety of using these degrees in law, medicine and theology, as well as in arts, provided they stand for adequate courses of study, is generally recognized.

The requirements for these degrees in reputable colleges and universities for non-professional studies, are pretty well established, and are practically uniform; for the bachelor's degree a four year's course beyond what is given in a secondary school, such as a public high school or a preparatory academy; for the master's degree, a fifth year; for the doctor's degree a sixth and a seventh year, including research.

The four years' work for the bachelor's degree is supposed and designed to give a general education that fits a person for entering upon a special course of study for any profession. If the B. A. or B. S. graduate wishes to become a teacher or an author—elects to make scholarship his profession—he enters the graduate school and pursues special courses for M. A. or Ph. D. If he wishes to become a physician, he enters a school of medicine and pursues special courses of study for M. D. If three years are required for the completion of this work, the degree of M. D. ought to be considered on a par with that of Ph. D.

A slight modification of the above plan now largely adopted in American colleges is three years of college work as a basis for the beginning of specialization for a profession. Electives looking to professional degrees are introduced in the fourth year so that the bachelor of arts or bachelor of science may then, after three years of special study, become a Ph. D., M. D., L.L. D., or D. D. L.L. D. and D. D. have been conferred so frequently as honorary that the degrees J. D. (Doctor of Jurisprudence) and T. D. (Doctor of Theology) can with advantage be substituted for them.

The great development of the arts and sciences in modern times has brought the necessity of specialization in their various branches, such for example as agriculture, engineering, chemistry, pharmacy, surgery and veterinary medicine. For special courses of study in these branches the degrees of bachelor, master and doctor had been given. In some cases there are subdivisions, so that, for instance, there are not only engineers, but civil, mechanical, mining and electrical engineers; not only doctors of surgery (itself a branch of medicine), but doctors of dental surgery; and in addition to doctors of chemistry, there may be soon doctors of analytical, organic, technical and pharmaceutical chemistry. These are but a few of the many examples that might be given. While some of these degrees are granted only on high requirements and are generally understood to stand for scholarly attainments, others are conferred upon persons at

the close of a professional course taken without sufficient preliminary general education as a basis. These latter cannot be regarded as distinctions of honor, but they have rather the effect of bringing into discredit the professions for which they stand. A diploma showing that the holder has taken the degree of bachelor of engineering or doctor of engineering, is virtually a letter of recommendation with respect to general scholarship as well as special training. The standard has been so well maintained for these degrees that while there is of course some difference of value, depending upon the equipment of the engineering school, one does not find it necessary to inquire where the degree was obtained to be assured of its worth. The profession of engineering is on a high plane. The holders of the time-honored degrees B. A., Ph. D. and M. D. do not feel that the bachelor's and doctor's title is unworthily bestowed in the profession of engineering.

Can these things be said with reference to D. D. S. and Phar. D.? Do these titles carry with them the assurance that the holder is a well-educated man? And, if they do not, if many graduates holding these degrees are deficient in knowledge of the ordinary branches of a secondary education, is not the standing of the profession thus lowered? The history of medical education in the United States teaches a lesson here.

In a new country like the United States the collegiate and medical education, such as was required in European countries to enable one to get license to practice medicine, was not within the reach of as many persons as were needed as physicians. A concession in requirements was necessary in order to supply the demand for physicians. Absence of strict laws, or else lax enforcement of laws, gave the opportunity to corporations to confer the M. D. degree through mercenary motives on remarkably easy terms. It has not been very long since hundreds of young men with not more than the rudiments of an education were turned out annually by medical colleges, with the degree of M. D., after attendance upon two courses of lectures of five months each, the second course being a repetition of the first. Realizing the disrepute into which the profession had fallen, and that the excuse for ignorance no longer existed, that facilities for higher education in the United States had become accessible to any person endowed by nature with sufficient mental capacity to appreciate them, the American Medical Association some twenty years ago took up in earnest the work of educational reform, and through just such subsidiary bodies as our Section of Education and Legislation and our Conference of Pharmaceutical Faculties, secured the enactment of more stringent laws regulating the practice of medicine, compelling medical colleges to raise the educational requirements for the degree of M. D. The medical schools have now nearly all come to the four years' course, and the best of them are requiring a college course of four years and a professional course of three, or a college course of three and a professional course of four

years to graduate, thus making the work for obtaining the degree of M. D. equivalent to that for the degree of Ph. D.

Now what is the wisest policy to adopt with respect to the degree of Phar.D.? Shall it be made attainable by men incompetent to enter a medical college, and by several years' study less than for M. D.? If so, the Phar. D. must not expect to be recognized as on an equality with the M. D., and pharmacy must be content to rest upon a lower plane than medicine. It may be said that as a profession its field is narrower than that of medicine. It may, like surgery, dental surgery, and veterinary medicine, be considered a branch of medicine. Yet it has the advantage over these of drawing more from outside sciences, and though more limited in its scope than medicine, it is not necessarily on a lower plane as a profession. The man equipped with the knowledge and skill that a thoroughly educated pharmacist should possess may stand as the peer of any M. D.

A writer says in an article published lately in one of the pharmaceutical journals: "Let the ambitious scholar who desires a higher degree, one beyond the regular requirements of his vocation, seek it, as so many have done with credit to themselves, in the better established sciences and in philosophy." But why, we may ask, should pharmacy be confined to one degree, to one dead level for all alike? Why not let the "ambitious scholar" find the reward for higher attainments in schools of pharmacy? Young men of this kind are the very persons most likely to accomplish something great in the world, which will reflect credit upon pharmacy. Then more young men of education and ability will choose to enter our schools of pharmacy, seeing that in the profession of pharmacy honor and distinction are attainable.

It has been said that the "standard will not suffer by making all graduates Doctors of Pharmacy, because the State Boards of Pharmacy will become more closely associated and will raise the standard, both of entrance to and exit from colleges;" and the writer virtually adds, if some schools do not wait, but move faster than the Boards in advancing the standard, such "enthusiastic and erratic pioneers will continue to suffer."

The proper sources of suggestions and movements for the advance of pharmaceutical education are the Educational and Legislative Section of the American Pharmaceutical Association and the Conference of Pharmaceutical Faculties. These bodies are concerned not only with the advancement of the standard of education in the schools, but with securing the enactment of laws that will support the standard established. The Boards of Pharmacy are neither educational nor legislative bodies. Their duties are executive. They are appointed to see that the laws are enforced. In the Southern States, as far as I know, the Boards of Pharmacy have made no effort to raise the standard of education directly by suggesting it to the schools, or indirectly by increasing the difficulty and thoroughness of the

examinations they set. They do faithfully, I suppose, all that the laws require. But unfortunately the laws relating to pharmaceutical education in some of the States are of such a character as not only not to give the advantage to a graduate of a school of high grade, but to put him at a disadvantage—to favor the school where a diploma can be obtained in shorter time, consequently at less expense and with smaller amount of work and less general education. So that the schools called "enthusiastic and erratic," striving to raise the standard of education and to make pharmacy educationally worthy of the name of a profession, *do* suffer, and those of lower standard reap the benefit.

If no protest is made against conferring Phar. D. as the ordinary degree, pretty soon every little college competing for popularity by furnishing diplomas on terms the shortest, easiest and cheapest, will hasten to adopt it. Offering the title "doctor," will be a drawing card. The prospect of being called doctor is not to be despised, especially by vain and ignorant persons; and many a one, indisposed or unable to rise by prolonged effort through merit above his fellows, will hope to gain prominence by means of a title, and will seek the title where it can be most easily acquired. But what will the title be worth? Educated people will soon begin to discount the pharmaceutical doctor, and young men of promise will avoid pharmaceutical schools.

It is a mistake to say, as the writer above referred to has said, that "the single thing that would do most to gain recognition for pharmacy as a profession is a professional title." Of what real value is the title of captain or colonel applied to a man who has never been in any army except the militia of his native town? How much does it add to the intelligence and character of a boy to name him George Washington or Benjamin Franklin? Pharmacy would gain recognition by the assumption of a title representing less than its current amount of education in about the same way that it would gain wealth by accepting counterfeit dollars.

It is scarcely worth while to mention the argument that the title Phar. D. should be given to all graduates in order to relieve the embarassment of modest Ph. G's and Ph. C's from being frequently addressed as "doctor" by the public. As a general principle it may be said, educational policies ought not to be changed to remedy a slight annoyance such as this, but even should a change be made, it should not be by conforming to the mere fad of ignorant and thoughtless people.

It is said that the practice of calling nostrum proprietors and the like "doctors" exists because the number of pharmacists who now hold the title is too few to defend it from misuse. "Give the title" says the writer, "to all honest young men and young women who seek fitness to practice pharmacy through accepted channels, and they will valiantly defend it against usurpers, and against its misapplication by the more careless and less intelligent public." We have already attempted to show that the

remedy is worse than the ailment because it lowers the standing of the profession in the estimation of the *less* careless and *more* intelligent public. If the remedy, however, must be applied, we venture to suggest that it will accomplish the object more effectively if administered in larger dose—make the "nostrum proprietors and the like" doctors too. The army of the "defenders" would then be greater.

The statement which has been made, that "the title, doctor of pharmacy, has never meant more and never will mean more than that the bearer has been adjudged worthy by some legally authorized school to practice pharmacy, plain, everyday pharmacy," is assuming that the use of this title for the ordinary course, by several colleges—by the larger ones for only the last few years—has forever fixed its value. Such an assumption is unwarranted. Should this representative educational body, and all, or nearly all, of the best schools of pharmacy, adopt higher requirements for the doctor's degree, requirements corresponding to those which have existed for years for its cognate degree Ph. D., and so announce to the public, the announcement will be readily understood by the intelligent public—the class of people that pharmacists are particularly desirous of arousing to a keener interest in pharmaceutical education and the profession of pharmacy. Especially will this be the case if the degrees Ph. G. and Ph. C., which have long been used for the ordinary courses of study in many schools of pharmacy, be retained to represent practically what they have long stood for in the best schools.

It may be said that the plan here advocated of conferring the bachelor's, master's, and doctor's degrees only upon candidates with educational qualifications equivalent to those required for the corresponding college and university degrees, leaves no higher degrees for the Ph. G. or Ph. C., who without the advantages of a collegiate non-professional education continues his work at the college for one or more years after graduation, or later becomes distinguished in his profession.

I believe myself that there should be some way for colleges to show their appreciation of work of this kind; and, as colleges bestow honors mainly through degrees, there should be some degree which may be used for this purpose. If no suitable new title can be proposed, and one of the old ones has to be taken, probably Master of Pharmacy can best be spared. Its use, however, as an honorary degree, if allowed at all, should be carefully restricted. An honorary degree easily becomes an "onery" degree.

Mr. Hynson then read a paper on the subject of the doctorate degree in pharmacy, taking the affirmative of that question:

WHY THE DOCTORATE DEGREE SHOULD BE SETTLED UPON IN PHARMACY.

BY HENRY P. HYNSON.

Happy will be the day when a fixed standard of sanity is known, that one may test his impulses and ascertain whether they are erratic nothings, which may be disregarded, or worthy tendencies that should be followed; then will one's associates exactly know whether he be a subject for pity, condemnation or praise. Until that same happy day one will not know that a sense of duty has been improperly named and must still take chances as to what his real mental condition may be.

It is with unfeigned diffidence and deep humility that I continue the discussion of a subject which I was forced to essay by an impulse that would not down, and I should be greatly pained did it seem possible for any one to think I value my expressions as being more than the opinion of one who believes he is right, though fully assured that greater wisdom is in the council of the multitude.

Unless carefully guarded against, much will creep into this discussion that is entirely apart from it; much that is apparently connected with, but which is not dependent upon it; much that is decidedly general and not at all peculiar to pharmacy. Let us agree, then, to adhere strictly to the point at issue, and, by elimination and concentration, discover the real active principle and name it. What shall we eliminate? First, the comparative condition of pharmacy. Few are old enough or have good enough memories to use their own experience as a basis, and those who are really familiar with history will not give way to folly regarding this. It is irrelevant and should not be touched upon.

Standards of entrance and exit to and from our colleges are questions of general education. The proper requirements for matriculation and graduation have been continuously discussed from the very inauguration of higher education: in all the professions; in those with high-sounding and with commonplace titles; in theology; in law; in medicine from the beginning and in pharmacy, to our certain knowledge, since 1829, but with no more effect than to make progress *pari passu* to general progress. These subjects will be discussed until the end because they must change until the end. They are necessarily purely chronic questions and are great enough to stand and must stand upon their own importance.

The relative value of the instruction given in the various schools, about which I fear it will be found there is rather prejudiced opinion and interested estimates, and the varying examinations of the several state boards of pharmacy, which, in a number of instances, are controlled by legislative enactment, while important and worthy of most careful consideration, are quite separate and distinct from the question under treatment, and should be excluded.

By accepting it as a *truth*, a truth of which we may well be proud, that

we have a score or more of schools of pharmacy, the very large majority of which are earnestly and conscientiously striving, through their boards of control and their faculties, to make of their students—of the material furnished them—fit and competent practitioners of pharmacy, and that this material, of which so great complaint is made, is the best that can be had, the best pharmacy can command; in fact, all that is needed to make pharmacists who are fully able to meet the requirements of the day and of the generation—we will eliminate any attempt to deny that these men as a class ably serve the public, fully satisfy their clients and render such assistance to physicians as the latter require. How obviously unfair, unreasonable, to expect pharmacy, with a professional existence of not much more than fifty years, to demand standards of entrance, attendance and graduation relatively much higher than those of all the other professions at an equal period in their histories.

It seems nothing less than sheer folly to contend that, as a class, they are not improved in the science and art of pharmacy, are not better equipped than their predecessors—than their elders. What nonsense to write about "academics," in the face of a great truth like this! It is a *truth* that they are graduated from our faithful schools of pharmacy, schools, the very existence of which, in this extremely practical age denies most positively the charge that they fail in their duties to either society or to pharmacy. It is a truth that those graduated do meet the requirements of society and of society's laws. It is a truth that they fill positions of most serious and exacting trust in their several communities, and it is a truth, a truth that cannot be shamed, that they are worthy of a title, a professional title such as is freely accorded them in respectful homage by clients, by friends, by colleagues, by associates, by members of other professions, by all mankind that is just and kind and appreciative. Acknowledging, then, that these graduated students are entitled to qualify as practitioners of pharmacy, the specific question appears, to which we are seeking specific answer: what is the most popular and helpful title or name for him who has attained that degree of proficiency which entitles him to certification by a college as competent to practice pharmacy?—Meaning nothing more or less than competent to select, preserve and dispense material peculiar to medical treatment, especially to compound physicians' prescriptions. How shall he be introduced? Will it be "Graduate Mason," Pharmaceutical Chemist Mason," "Master Mason," "Old Marse Mason," or shall it be "Dr. Mason?"

Why, in Heaven's name, should there be introduced into this harmonious symphony of propriety, usage and encouragement, our little puny fiddlings about "academics"—academics!—whines as to German customs and Russian—save the mark—practices; tum, tum, tums of high schools and low schools; tittle tattle of thirteen and three-quarters and fourteen university counts? What does it all mean? If, as some say, our colleges are

giving certificates of competency to men who are not competent to practice pharmacy, then a wrong is being done, which a change of title will not correct nor continue.

Medicine and dentistry, allied professions, and with much the same aim as pharmacy, with all the obstacles and much the same experiences, never had, never have, any doubt as to what is the proper title for their graduates; they are satisfied. Is there any one silly enough to think their members will ever abandon the title they have so honorably worn? They also contend regarding entrance requirements and graduation standards; about two-year, three-year and four-year courses; about all such things, just as we do; but who among you will be able to persuade them that all these questions, as well as the fee table, will be settled by the name they use for the degree they confer.

Before we reject this proffered settlement:

1st. Let us try to be somewhat like others, realize that we are living in the twentieth century, that we must accept practices and usages now prevailing and not expect to encumber this age with the effete doings of medieval times.

2nd. Let us remember we are living in America, which has been an asylum to some of us; living a broader, better life; upholding the principle, "the greatest good to the greatest number." That, since it is the country in which we are proud to be and to which we are glad to migrate, its practices and standards cannot be so much lower than all the world; that American pharmacy could not be so comparatively high, if American pharmacists were so comparatively low.

3rd. Let us accept the fact that usage makes law, especially in language; present usage and meaning takes certain precedence over obsolete definition and application. To what percentage of the American people does "doctor" mean "a learned teacher?" To about as many as would spell *jail* g–a–o–l!

4th. Let us acknowledge that pharmacy, in its highest and best practice, is and must be closely allied to medicine; that a closer relationship is most desirable and that pharmacy's greatest possible ambition will be realized, when it becomes a respected branch of medical practice.

5th. Let us own, no matter how humiliating it may be, that dentistry, although a much younger profession and scarcely so important, holds, relatively a much higher professional and social position than does pharmacy, which cannot be explained, unless we admit that the latter has been misdirected in its course of progress.

6th. Let us condemn the extreme bad taste and inconsistency of those who deny pharmacy's worthiness; of those who attempt to belittle and criticise those professions that bestow upon their graduated students the title of doctor, albeit, to the better professional and social standing of these, they bid us ascend.

If we open our minds to the truth of all these statements, which, it seems, we must, we will necessarily accept "Doctor of Pharmacy" as the most popular, the most appropriate and the most helpful title for the degree, *hereafter* to be conferred by our colleges upon those deemed worthy to practice pharmacy. It is popular with those who wear it and with those who use it. It is appropriate because it is so closely, almost exclusively associated with the healing art. It is helpful because it at once establishes the professional character and the professional association of its bearer.

And, now, what of the other titles proposed, with which we are too well acquainted; the unfortunate hindrances we have been carrying so long? What of Graduate in Pharmacy? It is still as awkward and meaningless as it was when first used. It is, in its very self, but a general term applying to all sorts and conditions and can never carry any force or honor. It is as impossible as an address as "Pharmaceutical Chemist," which is the most absurd of all as a title for a pharmacist. Chemistry is but one of the several branches of pharmaceutical knowledge, and the term chemist has a restricted meaning in this country. A pharmaceutical chemist, even to ourselves, is understood to be one who is proficient in that branch of chemistry that relates to medicinal substances and their combinations. Medical chemistry and physiological chemistry are taught as important branches of medical science. How would "Medical Chemist" do as the title for the practitioner of medicine? Why not call our graduate students "Pharmaceutical Botanists," or "Pharmaceutical Microscopists."

Master is much better; it might be used as a means of address, is comprehensive and somewhat pleasing. If some of our teachers *will* graduate students, whom they, even themselves, discredit and pronounce unworthy to wear a distinctive and proper title, let us, by all means, have "Master," although no one likes it, no one would use it, and it smacks so decidedly of other classes and other things than professional men and medicines. It may be found that the adoption by us of this title, would be opposed by the master butchers, master plumbers, or master horse-shoers.

It is a fact, ascertained by actual inquiry, that 95 per cent. or more of our students want the title Doctor. It is also a fact, carefully ascertained, that a large percentage of those who have graduated, regret that they were not given the degree. It is a fact, again, that none of the leading medical men or scientists object to us using the title, specifically applied.

Let it not be said, as has been suggested, that, "since the bars are down, the pharmacists should be allowed to enter the pasture." It cannot be implied that the title "doctor" is less creditably worn by the members of the medical and dental professions because unworthy classes have used it. It is not into the *general* pasture that we seek admission, but the special acres where would graze those who have honorably proven their fitness to enter the field of pharmaceutical practice, as it needs to be practiced this very day.

The opposition, as far as can be discovered, is not from those most interested; from pharmacis s, educated pharmacists, engaged in pharmaceutical practice, but it comes, principally, from three classes: 1st, those who may be called "camp-followers;" 2d, those who have never made a pill; and 3d, those who have practiced pharmacy, but who feel they have risen to greater heights. All are out of sympathy with those who are actually at work in drug-stores, which places the objectors in positions to secure false views.

All these may again be divided into other classes, relating to the reasons for their opposition. There are those who say the title is too good for us, and others who say we are too good for the title; these will about counteract each other. Then, there are a few who think pharmacy, professional pharmacy, is and should be independent of medicine, and consequently, we should have nothing that is like medicine. The reason so few of this class are in evidence is because the others are confined.

The fourth and most important class are those who are honestly misguided. This is the most intelligent class, and the one we must respect and fear. In contemplating it, we might exclaim, "Save us from our friends." To this class belonged some of those noble men who inspired, husbanded and ably continued pharmaceutical studies in this country; who, with their followers of to-day, were so devoutly interested in pharmacy, so jealous of its welfare, so ambitious as to its future, that it may be most respectfully questioned whether or not all they have done has not been overbalanced by this misdirected sensitiveness. They have denied pharmacy the practical food it needed to make it strong. They have denied it the stimulating encouragement needed to make it proud, waiting for a better preparation, a better proving; waiting, always and forever waiting, for a better day. And what have they done with their child in all these eighty years or more of waiting? It has grown in spite of the starving, made progress in spite of the handicap, but what might it have been had it fallen into the hands of different trainers, had it been fed like others of its class, had its votaries been given a name with which to enter the race of honor, a name which might have been carried to the post of fame? As Mrs. Mallory H. Taylor, of Georgia, in her able and eloquent appeal for the same object has said, "Give us the clothes and we will live up to them."

The paper was greeted with hearty applause.

Mr. Kremers then read a paper on the counter-proposition, of why the doctorate degree should not be settled upon in pharmacy, prefacing his reading by the statement that his paper was based on the assumption that in good society the title "Mister" was all-sufficient:

WHY THE DOCTORATE DEGREE SHOULD NOT BE SETTLED UPON IN PHARMACY.

BY EDWARD KREMERS.

The purely academic discussion of the history of the bestowal of doctorate degrees in philosophy, medicine, law, theology, science, surgery, dentistry, pharmacy, etc., need not take up any of our time at present, for the historical significance of these and other doctorates will probably influence no one in this debate.* Suffice it here to state that none but the doctorates of the historic four faculties of the complete continental university have ever gained a firm universal footing, and that even several of these have lost much of their original significance as degrees in course; † that in spite of the rapid growth of science during the past century, and in spite of the prominence it has enjoyed of late at our highest institutions of learning, the distinctive degree of Doctor of Science never has gained a firm footing, although a number of attempts have been made by some of our most reputable institutions to gain for it a parallel significance to that of Doctor of Philosophy.

Whatever may have been the makeshift tendencies of the past, the bestowal of academic degrees is at last acquiring a certain stability of tradition in this country. While the makeshift tendencies referred to still manifest themselves to no small degree in the professional departments of instruction, even here they are giving way to the more general trend of affairs in matters educational. Any one who has eyes to see may learn that two distinct tendencies are manifesting themselves in this country at the present time: (1) The reduction of all higher and professional education to the four years' college course with the bachelor's degree as a basis, and (2) To the replacement of the multiplicity of degrees of the past by a few standard degrees recognized the world over.

To some it may appear that pharmacy is still hopelessly distant from the attainment of the bachelor's degree as the minimum standard. When the standard adopted last year by the Conference of Pharmaceutical Faculties falls short by at least six years, it may seem foolish to discuss this question on such a basis. Not so, however, for we cannot discuss it on any other and keep in touch with the trend of recent educational advancement in this country. As a matter of fact, whether we would or not, we cannot separate ourselves wholly from this irresistible onward movement.

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* For the literature on this subject, see: Berendes-Real—Encyklopädie der gesamten Pharmazie, zweite Aufl., Bd. 4, p. 434. Fr. Hoffmann: Pharm. Rundschau, 13, p. 75. M. I. Wilbert: Am. Journ. Pharm., 77, p. 215, with a bibliography of the earlier American literature.

† The highest general degree given "in course" is generally that of Doctor of Philosophy, and the highest honorary degree that of Doctor of Laws, irrespective of the character of work done or services rendered.

Moreover, during the past year more than one State Board of Pharmacy has, independently of State legislation, taken steps in advance of the action of the Conference of Pharmaceutical Faculties. Furthermore, several of our universities have for the past ten years sent out a small but growing numbers of graduates with this minimum standard of academic honors, the bachelor's degree in science or arts. President James, now of the University of Illinois, while president of Northwestern University, addressed the pharmacy students of that institution only a few years ago in the following words:

"Young men who are looking forward to a life of activity, of influence and of enjoyment cannot afford to neglect the opportunities which the community now provides so liberally for higher education. No young man should take up the study of pharmacy, who has not completed, at least, the first two years of a liberal course in college.

"In other words, the student should aim to obtain not merely the title of Pharmaceutical Chemist or Graduate in Pharmacy, but the title of Bachelor of Science in Pharmacy, a title which at the better universities indicates to-day that the man has not only a technical training in pharmacy but has the foundation of the liberal education of a gentleman—such an education as every American citizen who aspires to leadership ought to have, such an education as is open to day on easy terms to every boy in the community. I look forward confidently to the time when no university will give any other degree than that of Bachelor of Science in Pharmacy and will insist that the holder of this degree shall be, as the degree indicates, an educated gentleman as well as a trained pharmacist."

A profession, though not as old as pharmacy, which has outstripped it educationally in this country, namely, that of engineering, is developing rapidly along these lines. The College of Engineering of the University of Wisconsin, *e. g.*, has over six hundred students engaged in courses of study leading to a bachelor's degree equivalent to the degree of Bachelor of Arts, whereas the same institution has but a mere handful of pharmacy students pursuing an equivalent course of studies leading to the same degree, viz., that of Bachelor of Science.* Yet twenty years ago the outlook for engineering at that institution was not much brighter than that for pharmacy. Why, therefore, should we lose hope? At the older sister institution in Michigan the outlook for four-year pharmacy students is even brighter.

In medicine, law and theology the best institutions of this country are demanding a bachelor's degree for admission, and engineering colleges are offering five-year combination courses with the definite understanding

* The tendency to-day is to bestow the A. B. upon the completion of a non-professional; the B. S. upon the completion of a professional quadrennium of college work or its equivalent.

that these are to be dropped as soon as a like or similar entrance requirement can be demanded by them.

It is not the intention of your reporter to discuss college courses in detail, but it was necessary to point out to those not engaged in educational pursuits what is taking place educationally in this country, and that pharmacy must develop as has, *e. g.*, engineering, in order that still later it may follow the best example set by those institutions in the front rank of medicine, law and theology.*

What is the bearing of these preliminary remarks on the subject under discussion? It must be evident that any attempt to deviate pharmaceutical education from the course which general educational progress in this country of ours has laid out for all professional education is ultimately bound to be a failure; further, that attempts to bolster up insufficient college courses by high-sounding degrees will never prove a success, but will react upon the profession with the inevitableness with which the boomerang follows natural laws in the pursuit of its course.

Having been general in my remarks, which, I understand, are but to be an introductory to a general discussion, let me conclude with the recital of a few specific instances.

We are to learn by experience, therefore let us at least try to profit from others. The superior schools of pharmacy of France have given the degree of Doctor of Pharmacy for the last eight years. When the colleges of pharmacy in this country are ready to demand a bachelor's degree for admission; when they will demand in addition several years of academic study of collegiate character; when they will add to these two demands a third, viz., a dissertation based on independent research, which dissertation must stand the test of publication, then it will be but a matter of sentiment whether the successful candidate is to receive the doctorate in pharmacy, science or philosophy. In France the first is bestowed, in Germany and in this country the last. In Austria the last is likewise bestowed, but the bearer has the privilege to use the degree of Doctor of Pharmacy as its equivalent if for professional reasons he chooses to do so.

In Germany the degree of Doctor of Pharmacy has been bestowed a few times † as an honorary degree. Used as such, and such alone, its recipients were truly honored by the universities which conferred the degree.

In our own country the same degree was likewise given in several instances as an honorary degree by the Maryland College of Pharmacy early in the seventies. During the past winter the same institution has desired to honor its dean for twenty-five years of service with the bestowal of this

* Comp. Edward Kremers: "On the position of the American Pharmaceutical Association toward pharmacy education." Proc. A. Ph. A., 43, p. 447.

† Berendes: Geschichte der Pharmacie, p. 789, also private communication.

same degree. But what honor is there in such a degree if an institution confers the same degree to students, some of whom are possibly on a par with those candidates before State Boards who are reputed as being unable to construct a correct English sentence or to solve so weighty a mathematical problem as the division of one-half by thirty-two? While the dean of the Maryland College of Pharmacy was, no doubt, truly honored by his friends, the honor lay solely in the personal esteem revealed, and by no means in such a diploma.

Progress in pharmaceutical education does not follow the sound of brass or the tinkling of cymbals on commencement day, nor the distribution of any kind of a diploma. But let us beware lest we make ourselves ridiculous in the eyes of the educational world by following foolish precedent. For a college teacher to state that he is just as highly educated as the dancing master, and therefore insistent upon being called professor, is too absurd to require comment; yet some of our friends who are in favor of bestowing the degree of Doctor of Pharmacy upon their former errand boys and bottle-washers are in a position almost as precarious.

The more self-respecting, as well as more earnest, seeker after an education with the more modest bachelor's degree will find that his diploma will admit him not only into that large and ever-growing fraternity of liberally-educated men and women, but will give him a professional standing as well; whereas the "Doc" of the easy-road college, though the ignorant may look up to him as a wise man, will be, as he has already been, the butt of ridicule of jester and cartoonist.

Equally hearty applause was given the author of this paper.

On motion of Mr. Charles E. Caspari, the several papers read were ordered received and referred to the Publication Committee.

Mr. Whelpley, seconded by Mr. Lowe, moved that the report of the committee be now taken up and the recommendations acted upon *seriatim*, and the motion prevailed.

Mr. Caspari, chairman, read the first recommendation, in regard to conferring the degree of Ph. G.

This motion started a long and warm discussion, participated in by by Messrs. Beal, Caspari Jr., Mayo, Whelpley, Wilbert, Kremers, Hallberg, McGill, Seaman, Roehrig, Remington, Behringer and Main, most of the speakers favoring in one form or another the establishment of a pharmaceutical degree, the idea having its chief opponent in Mr. Roehrig, who saw in it a reflection upon the status of thousands of the older pharmacists now in the ranks. Some very decided opposing views were expressed during the discussion, and the recommendations had to be read and reread by the chairman of the committee, in order that their full purport might be well understood by the members. A number of motions and counter-motions, such as to re-commit (Mr. Kremers), to strike out the

word "minimum" in connection with the requirements (Mr. Roehrig), and to postpone (Mr. Beringer), and to limit to one degree, that of Doctor of Pharmacy (Mr. Beringer) were made, but all came to naught, being either withdrawn, lost or not pressed to a conclusion.

After the matter had been fought to a finish, the chair put the vote on the motion to adopt the recommendation, and it carried.

Mr. Caspari read the second recommendation of the committee in regard to the establishment of the degree of Ph. C., and Mr. Wilbert moved to approve as read.

Mr. Whelpley thought the words, "or its equivalent," would cover a multitude of sins, but he said he had no motion to offer.

Thereupon, the recommendation was approved as read.

Mr. Caspari passed to the third recommendation, that in regard to the granting of bachelors', masters' and doctors' degrees in pharmacy.

Mr. Stevens, seconded by Mr. Cohn, moved to adopt.

Mr. Remington opened the long and animated discussion that ensued by declaring that the Section would make a great mistake to adopt this recommendation in its present form, as, although favoring the granting of the degree, he did not think the time had come for requiring a man to take a university course before he could obtain this degre. He thought the three-years' course, with the proper preliminary educational requirements insisted on by a number of reputable colleges of pharmacy, before granting the degree, was sufficient.

Mr. Eccles also favored the degree, but with the requirements adapted to present conditions. There should be a gradual elevation of the standard and it should not be fixed too high all at once.

Mr. Charles E. Caspari entered a forcible protest against the title of Doctor of Pharmacy.

Mr. Schlotterbeck related some of his experiences with candidates for entrance to the University of Michigan, who wished to take a course in pharmaceutical chemistry, although they had already the degree of Doctor of Pharmacy conferred by other institutions. Some of them were wofully lacking in preliminary education.

Mr. Rusby stated that he was heartily in favor of retaining the degree of Doctor of Pharmacy for graduates of certain recognized institutions, and not to restrict it to the university class of Doctors of Law, Medicine, Divinity, etc. The degree should have some sort of similarity to that of Doctor of Medicine. He thought the time would come when the advanced views of Mr. Kremers would be the standard, but thought it was yet far in the future and there would be many gradations between.

Mr. Hynson, by consent of Mr. Kremers, upon whose motion action upon his resolution previously introduced had been deferred, now called up his resolution for consideration. He said he only wanted a fair, honest consideration of the merits of his resolution, without any parliamentary

tricks about it, and if the members did not approve it they could vote it down. He wanted the recommendation read, and then he had a substitute to offer.

Mr. Whelpley, speaking to this "triangular and perhaps quadrilateral" resolution, opposed it, upon the ground that it materially changed and raised the status of a "Ph. B." as they knew it in Missouri. The St. Louis College of Pharmacy had originated the degree, in recognition of the great demand for a degree on the part of ambitious students who desired to have a degree as a stepping-stone to the study of chemistry, or as employees in the wholesale houses. In Missouri, they must require practical experience for their Ph. G. degree, in order to have the diploma recognized by the State Board, and as these students could not get this degree, after much deliberation it was decided to give the lowest academic degree of Ph. B.

Following Mr. Whelpley's remarks, Mr. Wilbert moved that the language of the committee's report in recommendation 3 be changed to read "bachelor of *science*" in pharmacy, the title used by the state universities generally, and an entirely different thing from "bachelor" in pharmacy.

Mr. Hynson then offered the following as a substitute for the third recommendation of the committee:

Resolved: That this section recommend to the pharmaceutical schools of America and requests the General Association and the American Conference of Pharmaceutical Faculties to recommend to the same that, after the year 1906 they establish a uniform three-year course, with an entrance requirement of two years' completed work in a high school, upon the successful conclusion of which they confer the doctorate degree with the title Doctor of Pharmacy.

Mr. Lowe seconded the resolution just read.

The Chair then put the vote on Mr. Wilbert's motion to change the language of the third recommendation of the committee to read "bachelor of science" in pharmacy, instead of "bachelor" in pharmacy, and it carried.

Mr. Hynson now asked for a vote upon his resolution, which he offered as a substitute to the third recommendation of the committee.

Mr. Beringer moved to make it one year of high-school work instead of two, but Mr. Hynson declined to accept the suggestion. Thereupon the Chair put the vote on Mr. Beringer's motion, and it was lost.

The Chair then put the vote on Mr. Hynson's resolution, as amended by himself, to include two years of high-school work, and it was apparently lost. Mr. Hynson demanded a division, and the result stood 38 in favor of the resolution as amended and 32 against it, and the Chair declared it adopted. (Applause).

Mr. Anderson then moved the adoption of the report of the committee as a whole, as amended, and the motion was seconded by Mr. McGill and carried.

Mr. Whelpley then presented a short paper on the subject, "An Examination which a Competent Pharmacist can Pass at any Time."

AN EXAMINATION WHICH A COMPETENT PHARMACIST CAN PASS AT ANY TIME.

BY HENRY M. WHELPLEY.

It is the duty of a Board of Pharmacy to determine whether an applicant for registration is a safe person to place in charge of the average drug store of the present time.

The task confronting the Board is not that of measuring the amount of pharmaceutical knowledge which the candidate has at his tongue's end on the day of the examination after weeks or months of special cramming for the ordeal.

The problem is to form an adequate idea of the knowledge, skill and ability which the candidate can exercise seven days in the week during his life as a pharmacist.

I solicit your aid in framing a sample examination which any competent pharmacist can pass without any special preparation for the examination.

Please send me twelve (12) questions which you can answer off-hand, and of such a nature that any person competent to take charge of your drugstore can answer at least nine (9) out of the twelve (12).

I solicit questions on all features of the drug business as it is conducted to-day.

2342 Albion Place, St. Louis, Mo.

The Chair stated that this paper was simply a request for assistance and called for no discussion, and, without objection, would be received to follow the usual course.

Mr. Hallberg fairly convulsed the members by his reading of a paper he had prepared on the nomenclature of proprietary medicines. They made him read list after list of the unscientific, absurd, closely-related and confusing names for their remedies coined by these enterprising gentlemen, while they fairly shook with laughter. The following is the text of this paper:

THE NOMENCLATURE OF PROPRIETARY MEDICINES. THE CRUX OF THE SITUATION.

BY C. S. N. HALLBERG.

It is related of an old-time country practitioner, in a southern State, who not only had faithfully served the community in attending to the first arrivals, but also had usually been called on to name the little newcomers, that his patience finally became so exhaused that when appealed to in an especially urgent case he petulantly retorted, "Oh, name the twins Belshazzar and Beelzebub!" "Oh, pa," gleefully shouted the mother, "the doctor has named the babies Belshazzar and Beelzebub!" "Wal," re-

sponded the fond father, "if the kids be only as good as their names they will be all right!"

The incident may or may not be true, as it may or may not have any bearing on the naming of proprietary medicines. Let us see. The names looked imposing and mysterious; they had a suggestive and familiar sound, possessed a peculiar euphony, and in this case were thought proper names because the persons using them did not know what they meant or what they stood for.

MULTIPLICATION AND SIMULATION.

Is there any difference in the methods of naming the vast majority of proprietary medicines? Take a few examples:

Aseprol.
Aseptol.
Aseptolin.
Aseptin.

Albargin.
Actol.
Argentamin.
Argentol.
Argonin.
Collargol.
Ichtargan.
Itrol.
Largin.

Hematin.
Hematogon.
Hemoferrogen.
Hemoferrin.
Hemoform.
Hemogallol.
Hemol.
Hemorrhol.
Hemostate.
Hemotropine.

Lyptol.
Lysol.
Lysetol.
Lycorin.
Lygosin.
Lysidin.
Lysitol.
Lysoform.

Bromalin.
Bromamid.
Bromolein.
Bromidia.
Bromipin.
Bromol.
Bromopyrin.
Bromosin.
Bromphenol.

Dermatin.
Dermatol.
Dermogen.
Dermol.
Dermazon.

Iodipin.
Iodocrol.
Iodoformal.
Iodoformine.
Iodoformogen.
Iodoformsalol.
Iodogenol.
Iodolen.
Iodolin.
Iodophenin.
Iodosin.
Iodosolvin.
Iodothyrin.

Ferratin.
Ferratogen.
Ferrhemin.
Ferrinol.
Ferripton.
Ferroleum.
Ferropyrin.
Ferrosol.

Salacetol.
Salacetin.
Salifebrin.
Saliformin.
Saligallol.
Saliphen.
Salit.
Salophen.
Salochinin.
Salocoll.
Salocreol.
Salol.

Tannalbin.
Tannalborin.
Tannapin.
Tannformal.
Tannigen.
Tannipyrin.
Tannoform.
Tannochrom.
Tannocoll.
Tannopin.
Tannosol.

LACK OF SYSTEM.

Is there anything to suggest that a system or plan has been followed in naming these any more than in the naming of apartment houses, sleeping-cars or breakfast foods? Names of the latter often rival those of proprietary medicines, the following examples having been observed recently: A house called "Eudoxin," for a well-known synthetic; "Quantzintecomatzin," the name of a sleeping-car on the Oregon Short Line, might be a new name for hexamethylene tetramin, and "Apetizo," the iron food, may be mistaken for apetol, the strengthener that strengthens, a wonderful discovery composed of *nux vomica, gentiana purpurea, calumba jateor-*

rhiza, quassia amara, prunus virginiana, prinus verticillatus, simaruba amara, spiræa tomentosa, cinchona rubra, sumbul moschatus, aurantii cortex, aromatics, *vinum xericum fortior;* the "tonic that tones," that "gives birth to an apetite," made in Danbury, Conn., which in former times was famous through "Newsman" and as the home of "Synthetic Myristica," but is now devoted to the exploitation of the medical profession through a medical journal with half a dozen anonymous pseudo-chemical companies on the side.

CONFUSION WORSE CONFOUNDED.

Besides these there are preparations entirely distinct in character, with names almost similar, *e. g.:*

Mercauro, Mercurol, Mercuriol.
Euphorine and Europhene.
Papain and Papin.
Benzosol and Benzozon.
Glycozone, Hydrozone and Liquozone.

The last illustrious trio have demonstrated the dangers to the manufacturers in selecting names in the present haphazard, slipshod manner. The proprietor of the first two of the three alleges that the name of liquozone is unwarranted and misleading, and liable to confusion with his own. The liquozone proprietors charge business rivalry as the sole motive for the accusations against their famous germicide.

"Normalin" is a serum preparation of arsenic, administered internally in teaspoonful doses, for which formalin is liable to be dispensed, and "Lavolin" is the trade name for liquid petrolatum, exploited as the solvent for agents recommended in spray medication exclusively in a certain work on rhinology. Pharmacists who have never heard of lavolin naturally dispense lanolin instead, and thus innocently became partners in the absurdity of causing a sufferer to try to accomplish the feat of spraying an ointment through an atomizer.

SCIENTIFIC NOMENCLATURE.

It should be needless to point out to men engaged in any scientific pursuit the necessity for a scientific nomenclature. Without systematic terminologies, the sciences contributing to pharmacy can neither be studied nor learned. What botany, pharmacology or chemistry would be without scientific nomenclatures is best answered by remembering what they were before such were evolved by Linnæus, Flückiger and Berzelius. What progress was made in medical science until systematic terminologies were introduced in physiology, pathology and anatomy? Science is universal; without a universal language it can not progress. It is a fundamental object and purpose of all sciences to establish a universal language through more or less systematic terminologies. To deny the necessity for nomen-

clature in pharmacy is to deny that it is a science. But what are the facts? Pharmacy, or at least its original votaries, aided in developing terminologies, and in two of the sciences named the modern nomenclature was devised by pharmacists.

THE NOMENCLATURE OF THE PHARMACOPŒIA.

But before this period and beyond the present sciences, the formation of pharmaceutical terminology began, which finds expression to-day in the pharmacopeias of all nations. The pharmaceutical nomenclature, as represented by the Pharmacopeia, has not only the prestige of tradition and almost universal harmony, but is fortified through legal enactment in every country in the world. Each of the thirty different classes of preparations of the Pharmacopœia has a distinct meaning, and with those additional in the National Formulary they afford nearly every form in which medicinal agents may be desired. Why are they ignored? Have the terms aqua, liquor, spiritus, elixir, tinctura, fluidextractum lost their meaning? Do the old names, pulvis, pilula, etc., sound too commonplace; or is it that their simplicity would be incompatible with the claims of originality or novelty or wonderful therapeutic virtue of the products of these *début de siècle* ideas? Or, perish the thought, is it that the manufacturers are not acquainted with pharmaceutic terms, or do not know of the existence of the Pharmacopœia?

THE MOTIVES.

Possibly—probably—the scientific terms are ignored in order to impose more easily on physicians, to pander to their convenience and lassitude, to secure monopoly of products through trade-marks, to intimidate pharmacists with the cry of substitution, and, finally, to exploit the public with cure-alls.

Take these well-known proprietary medicines originally advertised to physicians exclusively:

Antikamnia.
Bromidia.
Fellows' Syrup.
Pepto-Mangan.
Scott's Emulsion.
Vin Mariani.

Would they have gone to the public if they had been known under the following titles, with the name of the manufacturer or other device as a trade-mark to indicate the brand?

Pulvis Acetanilidi Compositus.
Mistura Chloralis et Potassii Bromidi Comp.
Syrupus Ferri Mangani Quininæ et Strychninæ Comp.
Liquor Ferri et Mangani Peptonatus.
Emulsum Olei Morrhuæ cum Hypophosphitibus.
Vinum Erythroxylon.

While only two of the above, Antikamnia and Scott's Emulsion, are advertised directly to the public, all, except bromidia, are used for counter and pyramid window display by "cutters" and department stores.

TRADE-ADVANTAGE DELUSIONS.

Intelligent physicians are beginning to realize that they may just as well prescribe Peruna and other "patents" at once as to patronize proprietary medicines with trade-names. Many also refuse to prescribe any trade-named article for fear that they, or the pharmacist, may confuse the names and serious results may follow. And yet, in the face of this undeniable awakening of medical men, a firm of chemists of the highest standing has recently devised the following meaningless, empiric names for three articles of its manufacture: Duotonol tablets, quartonol tablets, sextonol tablets.

"Tonol" stands for glycerophosphates, and the prefixes refer to one number of different kinds of glycerophosphates, salts of alkalies, contained in each tablet. Now these names have been devised on the assumption that physicians will appreciate them, owing to their brevity and euphony; on the other hand, it is evident that these names will not appeal to the thinking physicians as they would under pharmaceutical titles, with the name of the illustrious founder of the firm as the trade-mark.

THE NAME IS THE BEST TRADE-MARK.

The name of the manufacturer or some distinct symbol or device is the only trade-name affixed to the scientific title that should be used to designate a brand or make of a product. When, however, a symbol of universal significance and profoundly reverent traditions is through a sordid judicature permitted to become the trade-mark of a particular line of manufacture, the necessity for some scientific system for the selection of trade-marks becomes evident.

The protection of the public is the primary object of a trade-mark, to aid the purchaser in distinguishing the brand or "make" he desires from all other brands or "makes." Naturally it is the maker's highest prerogative to protect the public in its right of selecting his brand. What should he choose for this distinctive designation rather than his own name—his as against the world?

But greed and avarice lay their vandal hands even on the symbol of the ancient republic of Helvetia, and trail this venerated emblem in the dust of venal trade by the grace of the State of New Jersey. The public must be protected against such vandalism; the medical profession is finally beginning to realize its anomalous position, and mindful of the dangers of Scylla and Charybdis, will soon refuse to recognize trade-names for medicines, and the pharmacist—well, he is familiar with the fact that the highest ethically-exploited trade-named article keeps company in the price lists of wholesale druggists with Lydia Pinkham, Peruna and Pierce of Buffalo. The wholesale druggist is the only purveyor of medicines whose fiduciary

frame of mind realizes that all articles with trade-names are primarily designed for trade.

THE REMEDY.

Since none of the parties mostly concerned, the public, the physician or the pharmacist, desires the perpetuation of trade-names, why should the manufacturers be allowed to use them; or rather, why should not physicians and pharmacists refuse to handle any trade-named article? Although this position may be brought on through agitation and education, the process will be too slow. The thing to do is to carry a case for infringement of a trade-name to the Supreme Court of the United States and get a decision in line with former cases, such as Castoria and syrup of figs, which will once and forever prevent exclusive use of a coined name for a medicine when there is no other name by which such article may be designated. The nomenclature is the crux of the proprietary medicine question; its reformation will be a boon to the physician and the salvation of the pharmacist.

On motion of Mr. Lowe, the paper was received and referred for publication.

The Chair stated that the unfinished portion of the morning's program would now be taken up, and called on Mr. Beringer to read a paper he had prepared on the Mann Bill. Mr. Beringer presented his subject as follows, receiving the hearty applause of his audience:

WHY THE MANN BILL SHOULD BE ENACTED.

BY GEORGE M. BERINGER.

In attempting to present the affirmative side of this discussion it is but fair to assume that most of this audience are aware of the existing conditions that necessitate the framing and advocacy of this legislation. It is to be regretted that the subject has not been more generally discussed by the newspapers and that consequently the mass of American citizens are still unacquainted with the evils which this measure is destined to correct. As the subject has already been discussed in several of our annual meetings, I fear that many of the statements may appear to you as familiar and perhaps even thread-bare.

That the issue may be clearly and sharply defined it appears desirable to succinctly state the various propositions and proposed modifications of our Patent Laws contained in this Mann Bill. First: It is proposed to modify the existing section 4886 of the Revised Statutes by adding the following provision: "Provided, That no patent shall be granted, on any application filed subsequent to the passage of this Act, upon any drug, medicine or medicinal chemical, except in so far as the same relates to a definite process for the preparation of said drug, medicine or medicinal chemical." Secondly: To amend section 4887 by adding: "Provided, however, that in case any drug, medicine or medicinal chemical, on which

a patent for a definite process for the preparation thereof has been granted on any application filed subsequent to the passage of this act, is not manufactured in the United States by or under authority of the patentee, within two years of the granting of said patent, and after the commencement of said manufacture the same is not continuously carried on in the United States in such a manner that any persons desiring to use the article may obtain it from a manufacturing establishment in the United States, then said patentee shall have no rights under the patent laws of the United States as against any citizen of the United States who may import such drug, medicine or medicinal chemical into the United States or who may produce or manufacture the same in the United States, or who may handle for sale or use such article so imported or manufactured."

It will be thus seen that we have but two propositions presented for discussion, the first to prevent, in the future, the issuance of product patents on drugs and medicines, and the second to compel the manufacture of patented drugs, medicines, or medicinal chemicals in the United States.

A third proposition contained in the bill as originally presented in the House of Representatives, provided, "That no patent shall be granted to a citizen of any foreign country which does not grant a corresponding patent to a citizen of the United States." This provision embodying the broad principle of reciprocity, had been the subject of recommendation contained in an annual message of President Roosevelt and received the endorsement of the Committee on Patents, but it was found to conflict with an Article of the International Convention Concerning Patents and so was eliminated from the amended bill until such time as the Article of the International Convention can be modified.

The writer will venture to advance a few arguments in support of the first proposition, namely, to modify the statutes so as to preclude in future the granting of product-patents.

First: The construction placed upon the existing law, permits of gross discrimination against our own citizens.

The construction placed upon the present law is that the granting of a product-patent gives to a patentee the absolute power to control not only the manufacture but also all commerce in that article in the United States. We cannot conceive that such a construction was the intent of the law or that its abuse could even have been dreamed of by the framers of that law.

The manner in which certain foreign manufacturers have availed themselves of this power or grant has demonstrated a grave error in our law, and accentuated the need for its amendment. They have been content with a legitimate good round profit when selling their patented medicinal chemicals in England, Germany, Canada and other foreign countries, but when they come to supply the American consumers they were not content with such an advance on these prices as might have been justified, but

have arbitrarily fixed for the United States market a price many times in excess of the intrinsic value and prices sold in other countries. These prices they have maintained throughout the life of their patents although the consumption has increased to an enormous extent. Not content with this method of holding-up our citizens, they place on every package sold in other countries an inscription forbidding its resale and export to the United States, thus assuring their agency in the United States ample prey, and so the American sufferers are their most profitable victims. They declare that the druggists of the United States must pay $1.00 per ounce for phenacetin which they supply our Canadian brethren of the pestle at 15 to 20 cents. A prominent New York pharmacist has recently publicly stated that "he was offered phenacetin in England at 70 cents per pound, but that the present law deprives him of the right to purchase it, or to import it, or to use it," and so he must pay for the same article purchased in New York from the patentee's agent, $16.00. The same method of extortion is practiced with other chemicals protected by product-patents, such as aristol, chloralamid, creosotal, salophen, sulphonal and trional, and we can hardly estimate the magnitude of this evil.

While statistics are not obtainable to fix accurately the quantity of phenacetin imported into the United States, it is estimated from information received from the most reliable source that the imports for the last fiscal year approximated 600,000 ounces. These figures show that the foreign manufacturers, on this item alone, last year obtained surreptitiously from the inhabitants of the United States in the neighborhood of half a million dollars.

Phenacetin is appraised by the custom authorities under the class of medicinal compounds in which alcohol enters or is used in the preparation, and under this classification pays a duty of 55 cents per pound or 3.4375 cents per ounce. Accepting the statement of our New York pharmacist as a basis and, allowing a fair transportation expense of say 20 cents per pound, the phenacetin offered could have been laid down in his store for $1.50 per pound. Make another simple calculation and you will perceive that in paying the agent of the German patentees $16.00 he has really paid them in excess of this price a tax or extortion amounting to 966⅔ per cent. In the face of these prices can any fair-minded and sane American advocate with sincerity that "we are not paying more than we ought."

That such outrageous injustice exists and has been deliberately carried on for a number of years is not denied. The manufacturer's agents admit this deliberate discrimination and their only excuse is that they keep within the letter of the law that permits them thus to levy a "blood tax." The very boldness of their acts become a menace to public welfare and, surely, a law that permits of such gross abuse of power, condemns itself and will be resented the harder as it becomes better understood.

Secondly: It deprives the drug merchant of the United States of the privilege of purchasing his supplies in the markets of the world and restricts him to the dearest market, in which, by fictitious methods prices have been increased at least 300 and 400 per cent. It is an axiom of political economy that every merchant should have the privilege of buying in the cheapest market. It is indeed strange that a nation that has taken such a pronounced stand in demanding freedom of the world's commerce, and that has been a dominating factor in determining that there must be an "open door" policy in the Orient, should at home permit, even for a short time, such arbitrary interference with the inherent rights of her own merchants.

Third: Justice and humanity dictate that medicines should not be rendered unnecessarily expensive. A tax on medicine is looked upon as more abhorrent than a bread tax, and this has been recognized as a fundamental principle by the most enlightened nations of the world, and for this reason they will not grant product patents, and only a few will even permit process patents on medicinal compounds and chemicals. The justness of this principle was long ago recognized, and in 1849 a special committee of the House of Representatives reported a bill to stop the patenting of medicines of all kinds. It is stated that until 1860 the patenting of medicines was entirely unknown, and it is only within the last twenty-five years that this question of patenting a process, and also the product of the process, has come up.

Fourth: The lack of reciprocity should stop the granting of such powers to foreigners. No other country grants such product patents, and if the United States is right, then the enlightened nations of Europe should long since have seen the wisdom of our law and followed the example. No, they grant neither their own citizens nor any foreigners such privileges. Then why should we be so magnanimous to their manufacturers? The language of President Roosevelt, "In all matters there should be reciprocity," is a strong, wise and correct plank for this nation to stand on.

Fifth: The National Government now occupies a false position as the official abettor of the oppressors of its own citizens.

By official sanction this coterie of German manufacturers of medicinal synthetics has been enabled in effect to levy a unique form of taxation upon our sick and suffering consumers. This may be construed by their friends and attorneys simply as legalized looting. The efficiency of their systematic methods of robbing by process is so apparent that the advocacy of a continuation of such inequitable and unjust taxation by congressional sanction is an insult to the moral character and intelligence of this nation. The State should not become a party to the placing of unjust burdens upon its citizens, and especially not upon its sick and suffering who appeal to our compassion and certainly deserve governmental protection. In the granting of patent rights the monopoly granted should

not carry along with it exceptional powers inimical to the welfare of the people.

Sixth: The present law has limited and prevented the development of the inventive ability of the American chemists.

The primary object of patent laws is to encourage investigation, discovery and invention. Instead of encouraging, our present law deprives our own chemists of an incentive to search for improved methods and processes, as the successful application of such processes of manufacture is precluded by the issuance of a product patent. It would be folly for an American chemist to patent in the United States any improved process for the manufacture of phenacetin, as under the existing law he could not manufacture this product, or even sell it here, if made abroad. In Germany there are at least seven process patents issued on this one product, and several manufacturers and the German consumers profit by this competition. It is contended that the cessation of the granting of product patents would in no wise curtail inventive genius, but would encourage healthy and successful competition among patentees.

Seventh: This evil is responsible for a large amount of adulteration and fraud.

The legal decisions sustaining the patentees in their unjust discriminations have been to many honest dealers but additional evidence of this unfair and unjust limitation of their rights. "A square deal" is quite as essential to the druggists as to any other class of citizens and the majority consider the present law as an un-American idea that should be promptly consigned to ancient history along with that of the robber barons. The enormous discrepancy existing between the prices in Canada and the United States is sufficient to encourage the ignoring of the inscription on the packages forbidding importation into the United States. As a result, large quantities of these synthetic chemicals have been sold to the druggists by peddlers and supposed Canadian importers. Unfortunately, in many instances, the articles supplied were no more reliable than the venders and were found to be in some cases gross sophistications. The German patentees and their agents were only too anxious to take advantage of the opportunity and give publicity to the occurrence in such ways as to do the greatest amount of injury to professional pharmacy. The methods of the blackmailer and the defamer of character were none too tame for these Shylocks. Their own avariciousness is primarily to blame and made such occurrences possible.

The intent of the second proposed amendment to our patent laws is to compel, in the future, the manufacture in the United States of any drug, medicine or medicinal chemical on which a patent shall be issued. In its support a few additional thoughts will be presented.

First: It will encourage the home manufacture of the finer class of chemicals which are now generally imported.

The existing patent laws have diverted such manufacture to Germany and have been a prime factor in building up the acknowledged pre-eminence of the German chemical industries. This conclusion has been reached by at least two independent investigations; the one made by the U. S. Census Bureau and the other by a special committee of chemists in England. The Census Bureau has issued a bulletin on this subject which suggests a number of strong arguments in favor of this proposed amendment. Should, then, a law be continued that prevents the employment of American capital and labor and extends advantages to a few foreign manufacturers that enables them to maintain and extend their supremacy? Shall such a grave national blunder be continued indefinitely?

Secondly: It will insure the inhabitants of the United States with a supply of such needed remedies in the event of a war, epidemic or other interference with commerce.

Thirdly: It will create an increased demand for American chemists and encourage research and national development in chemical industries. It is a sad commentary upon our present laws that, in 1900, we had in the United States only "twenty-five chemists employed in working on the subject of fine chemicals, while, in Germany, at the same date," the six largest coaltar-color firms alone employed 500 chemists and 350 engineers and technical men. The time is now at hand when the government should give the chemists of America a fair opportunity to develop their latent ability as inventors and manufacturers.

Fourthly: The proposed amendment is in harmony with the existing patent laws in most other countries.

The countries that have recently enacted patent laws, such as Switzerland and Japan, have given this subject consideration and have incorporated provisions of forfeiture of such patents, if not put into operation in their own country within specified times. The principle has also been in successful operation in Canada, and the report of the Special Commission of Chemists recommends that Great Britain adopt similar legal requirements, and consideration is now being given there to a proposition "to revoke a patent if it is proved that the article patented is worked abroad, and not in the United Kingdom.

In conclusion, it must be emphatically denied that the Mann Bill interferes with the *legitimate* results of the labors of any chemist or inventor. The cries of "piracy" and "class legislation," introduced are but puerile efforts at dust-throwing, and a sad exhibition of the weakness of the case presented by the protected manufacturers. They can only be compared with the false cry of "thief" promulgated to permit the escape of the real highwayman.

On the contrary, it is but the initiatory step towards the elevation of the chemical industries of America, and will prove such a boon to American chemists, and will stimulate such a national progress that will make these

industries eventually compare favorably with those of Germany. The greatest good to all, and the removal of artificial and discriminating impediments to industrial and economic advances is a national duty which cannot be shirked by Congress although action may be delayed by attorneys of the foreign manufacturers. Under the existing laws these manufacturers certainly have "a very good thing," and will exhaust every means to perpetuate such profitable monopolies.

The druggists of the United States are the intermediary between the manufacturers and the consumers of these patented chemicals, and so become more fully acquainted with the injustice and results of the present patent laws, and quite naturally they are advocates of the Mann Bill. It is, however, a calumny upon the profession of pharmacy to state that "the object of the bill is to enable the retail druggist to sell new inventions in medicine without allowing the inventor to have his royalty for them," or that "the dispensing pharmacist will not reduce his price for prescriptions calling for such articles even if he paid only one-third the present ruling price."

These statements could only emanate from the biased mind of one who is entirely ignorant of the commercial side of pharmacy. They are contradicted in fact by all experience.

These medicines and chemicals are the druggist's raw materials, and while he may possibly retain the same price for his labor and professional skill, trade competition steps in and will necessarily regulate the price of his finished production in accordance with the cost. Within the writer's recollection the price of quinine has steadily fallen, and while at first he sold quinine pills at $2.00 per hundred, to-day the consumer secures them at 25 cents per hundred. Is there an honest, practical dispensing pharmacist who, at the present time, prices his prescriptions calling for antipyrine costing about 20 cents per ounce at the same price that he did a few years ago when the patent-protected monopoly fixed his cost of that article at $1.40 per ounce? No, the consumer does, and always will, profit by the reduction in trade prices.

The paper was ordered to take the usual course.

The Chair stated that Mr. W. H. Burke, of Detroit, had contributed a paper on the opposite side of this question, but he was not present, and he left it to the Section whether the paper, which was in printed form, should be read at this time or referred. Thereupon, Mr. Eccles moved to read by title only and refer. Mr. Alpers called attention to the rule that papers whose authors were not present should not be read until the papers of those writers present at the meeting were read. The Chair stated that he was perfectly aware of the rule, and only made the suggestion since these two papers on the Mann Bill were in the nature of a debate on the subject, and one side of the question had been presented. Mr. Hynson said the paper had been read by him, and he had found it an interesting one

on the other side of the question, and he advised those who desired to be fair and honest to read both sides. The paper was then read by title and referred. The following is its text:

WHY THE MANN BILL SHOULD NOT BE ENACTED.

BY W. H. BURKE.

Every discoverer in this world should be entitled to his discovery. It is only fair that the creator of something which has not previously existed should have the exclusive ownership of the thing created. In the case of inventors, in our own country, monopoly is granted for a period of seventeen years; after this the invention becomes public property, and is open to everybody. Under our patent laws a number of chemicals have been given protection for this period of seventeen years.

But it is contended by a great many retail druggists that the product patent granted in the United States to these chemicals is a detriment to the citizens of the country because it enables manufacturers to charge a high price for the articles; and they further aver that Germany, the country from which so many of our patent synthetics are received, has a less liberal regulation than ourselves in regard to their protection. This, in a word, is the essence of the argument in favor of the Mann Bill, which would deny a patent on the products themselves and restrict it to the processes of manufacture, after the custom of Germany. Is it sound reasoning?

So far as the alleged difference is concerned between the American and the German laws, I believe that a careful examination of the German law, which protects only the process of manufacture, and the American law, which protects the product also, will show that there is no material difference. In Germany, if a patentee complains that some one is infringing on his process, the burden of proof rests upon the defendant. The latter must prove to the courts that his process constitutes no infringement; and until he can so prove himself innocent he is deemed guilty. In America, on the other hand, if we gave a patent only on the process, as the Mann Bill would have us do, the complainant himself would be compelled to prove that his process had been infringed upon, for in the courts of this country a man is deemed innocent until he is proved guilty. The burden of proof rests upon the complainant; and in this case the complainant would have to drag the imitator into court, and prove that his process has been infringed upon—an almost impossible thing to do.

And so it is that the process patent of America affords no such protection as the process patent of Germany; it affords, indeed, practically no protection at all; and my contention therefore is that we must continue to give American manufacturers the product patent if we are to afford them as much protection as the German manufacturers get in their own country under the process patent. Giving this product patent to them

now, *we are doing no more for them than the German government is doing for the manufacturers of that country.*

Furthermore, the Mann Bill would in many cases prove ineffective anyway for the reason that there is frequently only one process for the production of a chemical, and where this is so, the process patent does not differ from the product patent in establishing a monopoly. Our courts have ruled, too, that it is no infringement of a process patent to import, sell, handle or use the product of a process; that to show the infringement of a process claim, the patentee must prove a piratical use of the process in this country.

One great argument against the Mann Bill is the spirit of injustice which is behind it, and which it breathes forth in every line. It must be that some of us do not appreciate the very great expense of scientists, laboratory equipment, books, etc., required by an institution doing research work; the countless experiments that end in naught; the immense expenditure of time and money before a new chemical is found that proves to be a "winner." Even after the discovery of a useful compound has been made, think about the trials that must be made, not only on the lower animals, but on man, before the use of the remedy can be determined under all circumstances. And after the inventor has something good, it still remains for him to convince the medical and pharmaceutical professions. We all admit that the education of the medical profession in the use of a new remedy can be achieved only as the result of a vast expense. Indeed, it is more expensive in our own country than in any other, on account of its great size, its scattered population, and the immense number of trademarked remedies that are being exploited on every hand.

Under these conditions a manufacturer needs and deserves what protection the American product patent can give him. He must have it if there is to be any inducement at all for him to enter into competition with the German manufacturers and strive to build up American enterprise in the invention and discovery of synthetic chemicals. Would you cripple this new industry? Would you subject your country to the taunt that we must go to Germany for our real research work and for the discovery and invention of synthetic chemical products? We ought to have more national pride than this. We ought to have more justice. We should take a broader view of the question, and look farther into the future than we have done before we cripple and shackle the manufacturers of our own country.

Many advocates of the Mann bill and many other good people also argue that no one should monopolize any remedy or any device intended for use among the sick and suffering. They say that Dr. So-and-So and Chemist So-and-So have given the world the results of their labors without price. We admit that this is very generous, and we urge every scientist to do so who can afford it without injustice to himself or his family, but we

deny that there would be the same advancement in medicaments and surgical appliances if our inventors were not influenced by monetary considerations. And certainly our manufacturing houses *have* to be so influenced if they are to pay dividends to their stockholders.

The whole patent agitation resulting in the Mann Bill has largely arisen because of the conditions with respect to phenacetin. Phenacetin has been singled out to show how the American people were being held up by greedy foreign manufacturers. But there is a greater disparity between the German and American prices of this product than of any other, because the process for phenacetin was published before the patent was applied for, and for that reason the patent was refused by the German government. This left the manufacture of the chemical open to all German makers, and thus the price was at once fixed by competition. We must expect a very great disparity in the prices of any article that is patented in some countries and not patented in others, whether it be a chemical or anything else, and the fact remains that the phenacetin situation has never been repeated with any other product. In the case of no other chemical has the difference been so great between the German and American prices. The patent on phenacetin now expires within a year or two, and thus the one product which has practically brought the Mann Bill into existence will cease to be a thorn in the flesh. The barn-door is to be locked after the horse has gone!

Referring to that provision of the Mann Bill which requires a patent to be worked in this country, it must be apparent to a great many of us that there is a much smaller demand and use for most of these synthetic compounds than there is for typewriters, cash-registers and thousands of other machines and articles, and that it would not be practicable to establish a factory in every country in which the maker desired to exploit his product, because the sales in that country would not be sufficient to maintain the institution. Is not this provision of the Mann bill, then, most unjust? It is not only unjust, but it is so shortsighted that it would have the very opposite effect from the one intended. The operation of such laboratories in many countries would not mean that the product would cost less, but on the contrary, that it would cost a great deal more.

But by all means the most cogent argument against the Mann Bill is this, that if proper protection were denied inventors in the United States by our patent laws, it is more than likely—it is absolutely certain—that the manufacturers would protect their interests by resort to secrecy. The immense expense of marketing chemical products would simply force the promoters to abandon the use of patents, keep the composition of their products secret, and employ mere trademarks after the manner of the so-called "patent medicines." Thus could the inventor protect himself from competition, for no one would have the knowledge enabling him to duplicate the products, but the *pharmaceutical and medical professions, as*

well as the laity, would be compelled to pay the manufacturer's price, not only for the seventeen years, but for all time! Hadn't we better have a monopoly for seventeen years than a permanent monopoly? Isn't it better to bear the ills we have (if ills they are) than to fly to others far worse? Furthermore, do we want secrecy in medicine and pharmacy? Of course not. Secrecy is the very thing we least want, and we should think twice before we caused American manufacturers in self-defense to resort to it.

And then, it is a question whether the pharmacist would be better off under such a system as the Mann bill contemplates. Suppose the bill were really to work as its advocates believe it will. Then we should have a number of brands of every product instead of one, and every pharmacist would be compelled to carry a dozen aristols in stock under different trade names, when he has only to carry one now. The Denver Chemical Company prepares antiphlogistine. It no sooner secures a successful sale than the pharmaceutical manufacturers offer Clay's poultice, Day's antiseptic dressing, anti-thermoline, glycero-plasma, pyrofistine, glykaolin, thermofuge, terra-plasma, plasmo and fifty others! No sooner do we have a sale on adrenalin than we are offered suprarenalin, adnephrin, adrin, caprenalin, hemisine, and so on. Following in the footsteps of urotropin, we have formin, cystogen, uritone, and eighty others.

I might continue these examples indefinitely, but they are sufficient to show that the retailer is compelled to carry a great many "shelf warmers" in stock for fear that some of his clientele will require one of he products under some particular trade name. Does the fact that we can buy some of these preparations a few cents cheaper compensate us for the investment and the annoyance to which we subject ourselves? Is not this very duplication of stock one of the things we have been grumbling about for thirty years? Would it not be a great deal better if we could only supply antiphlogistine on all orders for a poultice of this kind? Is not this competition very much like competitive telephone systems, where the greater number of companies we have in a given locality, the more expensive it is for the community and the more annoying it is for the subscribers?

The attitude of some good pharmacists toward the German manufacturers is to my mind somewhat similar to the peculiar views expressed in the following letter written in 1681 by Cotton Mather, the eminent divine who was so prominent in the early colonial affairs of America:

"To the aged and beloved John Higginson:

"There be now at sea a shipp called the Welcome, which has aboard it a hundred or more of the hereticks and Malignants called Quakers with Wm. Penn the scamp. at their head. The General Court has accordingly given secret orders to Master Haxett of the Brig Porpoise to waylay said Welcome as near the end of Cod as may be and make captors of the Penn and his ungodly crew, so that the Lord may be glorified and not mocked on the soil of this new country with the heathen worships of these people.

Much spoil may be made by selling the whole lot to Barbadoes, where slaves fetch a good price in rumme and sugar, and we shall not only do the Lord great service by punishing the wicked, but shall make great gain for his ministers and the people.

Yours in the bonds of Christ,

Cotton Mather."

This, you say, breathes forth all the venom and religious ferocity of the seventeenth century, and you declare that in this age there would be no tolerance of such sentiments. I am willing to admit there has been a change for the better, but it seems to me that many unjust prejudices and foolish inconsistencies remain to plague us even in the year of 1905 !

Mr. Lowe presented the following paper upon the sale of alcoholic liquors :

THE SALE OF ALCOHOLIC LIQUORS BY PHARMACISTS.

BY CLEMENT B. LOWE.

Pharmacists, when speaking of the United States Internal Revenue Tax, sometimes facetiously call it the Infernal Revenue Tax, and they are specially disposed to do so when they have in mind the tax of $25.00 which they must pay before they can legally sell a gill of alcohol, for any purposes whatever. This burden bears hard upon those who live in high-license states like Pennsylvania, where no alcoholic liquors whatever can be legally dispensed (outside of alcohol itself) excepting upon a physician's prescription. With the high prices for alcohol, and the very moderate profit at which it must be sold, many pharmacists do not make enough profit to pay the tax, and yet if they do not pay it, they must either disappoint customers or run the risk of being fined double the amount of the tax.

In prohibition states conditions are worse, there the poor pharmacist is " between the devil and the deep sea ; " in trying to avoid Charybdis he may be wrecked upon Scylla. If he sell an ounce of alcohol without paying the tax, he lays himself open to prosecution by the U. S. Revenue authorities. If he squares himself with the latter by paying the tax, he is liable to be pounced upon by the State authorities for violating the prohibitory laws of the State, because I have been told that in some of these States it is considered *prima facie* evidence of violation of the law for a pharmacist to pay the U. S. Revenue Tax. The stamp-receipt issued by the Internal Revenue Bureau has the following printed upon it which it may be interesting to quote : " This stamp is simply a receipt for a tax due the Government, and does not exempt the holder from any penalty or punishment provided for by the law of any State for carrying on said business within such State, and does not authorize the commencement or continuance of such business contrary to the laws of such State, or in places prohibited by municipal law."

Some fifteen years ago I made the acquaintance of a druggist who had

just sold out his business in a western territory in whose capitol city he was located; he claimed to have made $15,000 clear in three years. I asked him what his sales principally consisted of, his reply was "whiskey." He said he had a handsome room fitted up in the rear of the store which was patronized by the best people of the territory, the governor, judges, members of the legislature, etc. I would emphatically state that I have no sympathy with persons who thus "steal the livery of Heaven to serve the devil in;" they masquerade in the guise of the pharmacist only to find more profitable opportunities to ply a nefarious calling. I am of the opinion that the Government should make a discrimination between those who retail alcoholic liquors. Those who sell them as a beverage might well pay the present tax of $25.00 per annum, or in view of the profits to be made in so doing, might even pay a tax of $100.00. Those who dispense them only for medicinal purposes, on physicians' prescriptions, should pay a tax of $5.00 per annum; a larger tax is a temptation to increase sales so as to square one's self on the tax. If it were not for the fact that the U. S. Treasury shows quite a deficit at the present time, and therefore no legislation favorable to a reduction of the tax would be considered for a moment, I should be in favor of our Association petitioning Congress to make such a discrimination. I would state in addition, that I object more strongly to the business classification in which all who pay the tax are placed, than I do to the tax itself. It is bad enough to be compelled to pay the $25.00 tax, it is still worse to have a tax-receipt hanging in some "conspicuous place in your store which says, 'Received from . . . the sum of Twenty-five Dollars for special tax on the business of Retail Liquor Dealer.'" I am strongly in favor of petitioning the U. S. Government to give us a different classification, such as the business of dispensing liquors for medical purpose, or pharmaceutical dispensers of liquors.

The Government rubs it in still harder upon the wholesale drug trade, requiring them to have a sign "Wholesale Liquor Dealer," of a certain size upon the outside of their building. Fortunately most wholesale drug-stores have a rear entrance to which the obnoxious sign is usually relegated. Pharmacists in numerous cases do not receive as much support from their medical brethren as they should in their efforts to comply with the requirements of the law. Physicians frequently do not write a prescription as is required in a number of states, but tell the patient or some one of the family to go to the drug-store and get the liquor needed. If the pharmacist conscientiously endeavors to keep to the law and refuses to honor such a second-hand oral prescription, the physician will sometimes be offended by it. I have a case in mind of a young pharmacist who recently bought a store in the suburbs of a city where he was unknown. One of the customers of the store came to him and said, "their physician had ordered them to procure some whiskey for the patient who was ill with typhoid

fever." The druggist refused to dispense it at first, and only did so later upon the assurance that a prescription should be forthcoming in the morning; the prescription not coming to hand the next day, he called up the doctor on the phone to inquire about it. The doctor said "it seems to me that you are drawing things pretty fine down your way; give the man a quart of whiskey if he wants it." He added injury to insult, by afterwards sending the family for their medicines to another store, some squares distant. Intelligent members of the community are sometimes offended by the pharmacist observing the law. I know a case of a pharmacist of high professional standing whose manager refused to sell some gin for sickness without a prescription; the customer was so angered by the refusal that he transferred his account to another store. Such are some of the rewards which conscientious pharmacists receive for obeying the law.

The paper was ordered to take the usual course.

The Chair called attention to the lateness of the hour (6 : 30), and Mr. Boring, seconded by Mr. Hallberg, moved to read the remaining papers by title. Mr. Mayo moved to amend by referring the paper of Mr. Eccles on food preservatives to the Scientific Section, where it could be considered in connection with a cognate subject to come up there. The motion as thus amended was put and carried. The full text of such papers read by title and referred here follows:

TRADE-TRAINING IN THE PHARMACEUTICAL SCHOOLS.

BY OSCAR OLDBERG.

The public welfare demands that the apothecary shall be the sole purveyor to the people of all special supplies required for the relief of the sick and the promotion of health. He must have the scientific-technical education required to fulfill all of the professional duties which the pharmacist is properly expected to perform in these days of scientific medicine. But that is not all. He must, in addition, supply to the public in an intelligent and efficient manner all the articles of merchandise which the medical profession and the public have the right to expect a first class drug-store to be at all times prepared to furnish.

The public has no right to expect the apothecary to sell cigars, soda-water, ice cream, combs and brushes, and many other lines of merchandise commonly sold in the drug-stores. The flagrant incongruity of this general merchandising in a pharmacy is self-evident. The public might instead justly demand the exclusion from all drug-stores of any foreign traffic having a tendency to render the dispensing of medicines unsafe. Some day the apothecary will be forced to realize that in order to retain his rightful position he must faithfully perform his peculiar functions to the fullest extent and under conditions consistent with safety to the public. The pharmacy laws have no other object in view and no other justification. Miscellaneous merchandising on the part of the apothecary is justifiable

only in localities where the population is not sufficient to sustain a pharmacy without its aid.

But there is one kind of merchandise which the apothecary must sell. He must furnish to the community he serves all necessary sanitary, medical and surgical supplies. Necessary medical supplies clearly do not include quack nostrums. The traffic in such articles means complete repudiation of the ethics of the pharmacist's important calling, and is his worst enemy. It is in many cases extremely difficult to decide what is a quack nostrum, but it is not difficult to abstain from traffic in medicinal or alleged medicinal products the composition of which is secret, or only partially revealed, or misrepresented, or in any manner fraudulent.

The apothecary has inevitably ceased to be a manufacturer. He may even in this day make some of the preparations he employs as materials for compounding and dispensing, and various other products in his line for which there is a legitimate demand, but he cannot successfully and advantageously manufacture such standard stock preparations as powdered drugs, solid extracts, fluid extracts, oleoresins, plasters, bandages, dressings, coated pills, compressed troches, filled gelatin capsules, pepsin, pancreatin, malt extract, and numerous other products requiring special machinery, apparatus and facilities which the apothecary does not have at his disposal. Yet all these manufactured products are necessities. While it is true that some of the inventions of the manufacturers of medicinal supplies are valueless or even harmful, it is equally true that most of our manufacturing pharmacists have done much for the progress of medicine and pharmacy and that their services are indispensable and of great value. The senseless prejudice against them is impotent. Were it possible to abolish them the results would be intolerable retrogression.

Physicians who avail themselves of the real improvements and inventions effected by enterprising and skilled manufacturers are but doing their duty, and apothecaries are rightly expected to meet fully the legitimate requirements of the medical profession and the public. No one knows better than the intelligent pharmacist himself that the manufacturers do a great many things better than he, and that the only thing the manufacturers cannot and must not do is to compound and dispense.

The manufactured products which the apothecary must supply to the public include rubber goods, glassware, certain surgical implements and appliances, dietetic preparations for infants and invalids, and many other articles for the sick-room, the sanitary appointments of the home, etc. The soap and the dusting powder for the nursery, the rubber sheet, the catheter, the champagne tap, and any other article needed for the sick-room ; disinfectants and antiseptics ; bandages and dressings ; the graduated medicine glass—all are and should be found at the apothecary's officine. It would be an intolerable condition of things were not these related supplies obtainable at one place.

EFFECTS OF THE LAWS.

Among the earlier effects of these restricting measures, was the material increase of attendance at the established colleges of both medicine and pharmacy, and the establishment of many new ones, which have borne fruit in the greatly augmented number of better equipped followers of both professions, which in turn has led to the material elevation of the

EDUCATIONAL STANDARD OF THE COLLEGES.

As stated above, the first effect of the restricting laws was to encourage young men to study medicine and pharmacy, and although the standard of the schools at that time (a quarter of a century since) was by no means high, were nevertheless in keeping with the period, the curriculum usually embracing but five or six studies or chairs, extended over a period of two terms, twenty to twenty-two weeks each, with no questions asked as to preliminary knowledge, the student matriculating in the autumn of one year (October), and receiving his degree of M. D. a year from the following March, with a six months' vacation period between courses, whilst the course in pharmacy covered a like period, but in connection with an apprenticeship amounting to four years including the time spent at college. These young men then equipped found themselves face to face with an army of "legally" qualified men of each calling, most of whom were already established in business, a prospect that was by no means inviting, since with all the previous stock, a decided surplus was soon created. At this juncture radical changes are inaugurated in the curricula and requirements of colleges, the course being extended first to three and then to four years, and supported by sterner legal restrictions, until there is abundant evidence of substantial improvement everywhere. Hence conditions seem ripe for the establishment of interstate laws regulating the practice of Pharmacy and Medicine, since standards of requirements might be agreed upon of uniform character, that would work little or no hardship to any particular section and be productive of good to all.

THE DAWN OF A NEW PROFESSIONAL ERA.

With the completion of the organization into an association of the Boards of Pharmacy of the several States with the view to establishment of reciprocal relations, the enactment by the several States of amendments making the degree of Graduate in Pharmacy the minimum requirement for registration, and the earnest efforts on the part of the Health Boards of the different States to bring about inter-State reciprocity, coupled with a growing tendency of colleges of medicine and pharmacy to include in the curricula of each the sciences and studies common to both, believing that the physician is best qualified who is reasonably conversant with the essentials of pharmacy, just as colleges of pharmacy are recognizing the importance of a knowledge of bacteriology, physiology, therapeutics, and

even electro-therapy, it seems as though a new professional era were really dawning when each and every branch of the healing art will recognize the other as special factors in no way antagonistic, all laboring harmoniously for the general good in the battle with the ills of humanity.

THE HOSPITAL FACTOR.

The advantages of the hospital for the treatment of the more serious maladies has been generally admitted for many years, though by no means serving its full purpose either as a means for combating humanity's ills or as a factor of medical and therapeutical education, since, as our friend and worthy member, M. I. Wilbert, has truthfully said of them, it very often happens that they are too much inclined to use the patron of the hospitals as a means of testing the efficacy of innumerable patent and proprietary nostrums contributed by sweet charity through the manufacturer of same, and incidentally enriching the hospital exchequer, the donors accepting the advertising which their products receive directly and indirectly as their remuneration, whilst the patient pays well for all he receives, and often for that which he does not.

THE IDEAL HOSPITAL.

The conditions surrounding the modern hospital of our large cities are such as to make of it the ideal place for the treatment of disease, affording meanwhile the additional advantage of a modern training-school for graduates of the colleges of medicine and pharmacy, and since it is the custom of many of these institutions, particularly those under State, county and municipal supervision, to select as internes students who stand highest in competitive examination, why not go a step further and select the pharmacists in a similar manner, formulating their examination so as to cover every feature of the profession with a view to purchasing their medical supplies in the crude or original form in quantities, and have them prepared by the pharmacist internes for a meagre remuneration, in addition to the training he might receive while thus engaged.

Thus might the several features of hospital treatment be made to harmonize, instead of utilizing the pick of the medical profession with the best of facilities in other respects, and supplementing these by the questionable services of a cheap drug-clerk whose chief duty is to transform "nostrums" of unknown origin and lineage into medicine for sick people whose cases have been submitted to careful and scientific diagnosis to become one of several used to test the nature and efficacy of one or more patent or proprietary medicines after traveling a thousand miles, perhaps, which they might have encountered at home through an advertisement in some comic almanac. Let us see that the ideal hospital becomes a reality, thus cementing yet closer the vocations of pharmacist and physician.

Chicago, August 5, 1905.

RELATION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY TO ORGANIZED PHARMACY, ESPECIALLY TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY MURRAY GALT MOTTER.

This relation may be looked upon as threefold: genetic, functional and economic. The ultimate purpose of each of these associations is the promotion of the best interests of pharmacy. As these interests are varied, it is but natural in these days of organization and specialization that different phases of the work should appeal differently to different individuals; but, while this division of activity is both natural and necessary, the single purpose which should control and direct all should ever be kept in mind, lest a part seem greater than the whole.

Speaking broadly, it may be said that the essential function of the American Pharmaceutical Association is scientific and academic; that of the Druggists' Associations commercial and practical; while that of the National Association of Boards of Pharmacy is legal and protective. In the light of present tendencies, we are reminded of the ancient fable of the body at warfare with its members—and you may take either the Biblical or the old Latin version, as best suits your predilections. The moral is the same in both, and, you will remember, the stomach found, to its cost, that it could not do without the service of the hands and mouth, nor could the feet progress safely without the eyes.

It will scarcely be questioned that the American Pharmaceutical Association holds a certain maternal relationship to all other pharmaceutic organizations in this country, at least those of national scope. It would seem to be simply a matter of filial devotion and loyalty not merely to recognize but to foster and guard this relationship in every way possible. It has been alleged in some quarters that the American Pharmaceutical Association does not keep up with the times, that her methods are too antiquated; indeed, that she is decrepit—grandmotherly in short. In point of age, honor and deeds accomplished she may carry the title with dignity; and, it is to be noted that, when some measure of large import is to be accomplished, hers is the influence first sought. From the very nature of the organization this influence is great, and greater because disinterested. The Druggists' Associations are openly and avowedly commercial in their organization and their interests; their appeal is to the pocket rather than to the head or to the heart, nor are they less useful and necessary in their proper sphere. Bread is the staff of life, now as heretofore, and the baker demands his recompense.

Should we need proof that pharmacy, as a science, is progressive and progressing, we need look no further than through the pages of the Eighth Decennial Revision of our Pharmacopœia, which stands *facile princeps* among the Pharmacopœias of the world. Perhaps one of the most distinctive features of this Pharmacopœia is the stress laid upon scientific

accuracy, as shown by the introduction of a large number of assay processes. No less than fifty preparations, for which hitherto no definite strength had been fixed, are now to be standardized. Is it reasonable to expect that the raw apprentice, who matriculates at the soda-water fountain and graduates at the sink as chief bottle-washer, shall be competent to conduct such assays? There are those who decry the American Pharmaceutical Association as a mutual admiration society for the special delectation of the college professors. True it is that, from the beginning, science and education has been its propaganda and, if pharmacy as a distinct profession is to have any stability in the future, so must it ever be.

A few years since the advantage of a college training for the practical business man was indeed a mooted question. It is so no longer; the tide has turned, and the man who has had a broad theoretical training, in addition to his practical experience, rides high upon the wave of success. Certainly this is true in other professions, and if all signs be not deceptive it will become more and more true of pharmacy. Rarely, if ever, is there in the ordinary pharmacy time and opportunity, much less skill and equipment, to give the embryo pharmacist the training he should have.

The organization and functional development of State Boards of Examiners is in pharmacy, as in medicine, significant of the fact that the great American public demands of its servitors a higher grade of service, and will not be satisfied until it gets it.

We may rest assured then that scientific pharmacy will ever be fostered by the American Pharmaceutical Association, that the Druggists' Associations will provide the necessary wherewithal, and that the National Association of Boards of Pharmacy will see to it that those who have earned honor and position in the profession will be protected in the exercise of all their rights and the enjoyment of all their immunities. Now it should be the right of every thoroughly qualified pharmacist to practice his profession in any and every State in the Union, and in moving to a new location every such thoroughly qualified practitioner should be immune from the petty annoyances of the Examining Board which guards the portals of the State to which he seeks entrance. As every one knows, this is not now possible, but why! Is it not because we have failed in our duty to ourselves, to each other, and to the public? Success is not always nor ultimately to be reckoned in coin. A dime held close to the eye may obscure a whole world beyond. I greatly fear that all our professional life has been sadly marred by the blind commercialism of this ultra-commercial age, and that pharmacy, no less than medicine, suffers thereby.

But aside from the purely commercial view of the subject, there are other reasons adduced for the chaotic diversity of requirements for pharmaceutical licensure. It has been said, with rather more emphasis than accuracy, that the standard of requirement in the different states must, of necessity, vary, because—to take an instance actually cited last year—the

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people of Arkafornia do not need pharmacists of so high a grade as do the people of Massanecticut. This may seem plausible on the face of it, but the proposition will scarcely bear analysis. After all, there is but one standard guide, the Pharmacopœia, which is recognized either directly or indirectly in practically every one of the States; and certainly, the value of human life, which it is our duty to protect and prolong, is as high in one as in any other part of the Union. Herein, one would think, is to be found the true basis of our greatly needed uniformity, not merely in the passing convenience of the peripatetic practitioner.

There is an old saying that whatever is is well, and it is not half so fatalistic as it sounds. May it not mean that existing conditions are approved by the common sense of the general public, and that, therefore, and for the time being they are looked upon as good? The differences of opinion faced at our Kansas City conference were as great and as numerous, though perhaps not so weighty, as those which more recently have been adjusted by the Portsmouth conference. Especially in view of these differences, the unanimity with which the constitution of the National Association of Boards of Pharmacy was finally adopted was as striking as it was gratifying. Does not this give evidence that the principles therein embodied are of fundamental importance and are acknowledged as such? It has been subscribed to by nineteen of our State Boards, endorsed by a still larger number, and thus far condemned by none. These facts in themselves make a long step towards the uniformity sought. Now, when we examine this constitution, which is to be the basis of interstate reciprocity, we find it may all be summed up in one word—education. I fancy that when once this question is thoroughly apprehended we shall be eager to drop those qualifying terms "uniform minimum standard," for then our mark will be thoroughness and no thoroughly educated man will stop at the minimum. Moreover, if it be thorough in any one direction of course for that direction it will be uniform. Partial education, in any technical pursuit, is not to be seriously considered.

To summarize then, the National Association of Boards of Pharmacy holds a direct genetic relationship with the American Pharmaceutical Association. It can never, by any process of normal development, reach such a stage of maturity as to be wholly independent of the American Pharmaceutical Association, or of any other pharmaceutic organization with which it holds kin. That organized pharmacy may prosper it would seem to be necessary that every druggist be in the Druggists' Associations, every board in the National Association of Boards of Pharmacy, and all, every man jack of us, in the American Pharmaceutical Association. Our purposes are one, our interests one, and our goal shall be won if we are one. United we stand, divided we shall fall, and—fail.

A NATIONAL BOARD OF PHARMACY.

BY GUSTAVE WOLFF, N. Y. CITY.

At the 1903 meeting of the A. Ph. Assoc. the author among others contributed an article entitled "Interstate Reciprocity" in which he propounded a scheme to create a National Board of Pharmacy. As the "Board Problem" has previously and since created considerable discussion the initial steps towards practical execution ought to be now taken. At this meeting of the A. Ph. Assoc. there is to be held also a meeting of the Association of Boards of Pharmacy. Presenting some suggestions on this topic the author wishes to elicit further comments by others, in order to advance the matter to the point of execution.

A "Board of Pharmacy" is a committee elected by pharmacists of their respective states, or else appointed by its governor, possessing certain executive and semi-legislative powers. It is a part of the executive machinery of the state.

The board's two main functions consist of:

1. To examine candidates wishing to obtain a license to practice pharmacy (thus preventing incompetent charlatans from jeopardizing the health and the lives of the citizens) and to grant licenses to the successful candidates.

2. To regulate the conduct of pharmacies, the sales of poisons, etc. The boards generally have powers, similar to the district-attorneys, to prosecute offenders against the pharmacy laws. They also additionally try to enforce their own laws, (which, by the way, often are unconstitutional).

In those states where the governor appoints the board the pharmacists generally elect the candidates out of whose number the governor selects. The pharmacists are of course guided in their selection by the true fitness and, somewhat, by the popularity of their choice. A political official, though he be governor, is liable to be guided by political motives, leading to the danger of selecting a candidate less fit from the pure pharmaceutical standpoint.

The peculiar functions of the boards demand of their members the possession of two main qualities:

1. They must be of a scientific turn of mind, (some are members of a college faculty) to be good examiners.

2. They must be first-class, practical, level-headed pharmacists, in order to fairly administer the laws, as for instance, against substitution. This often severely taxes their tact, discretion and vigilance.

It is of course difficult to find the men having these qualities equally developed. It is a known fact that the scientist (some call him a bookworm) is seldom very successful behind the retail counter and, reversely, the practical up-to-date business man, to whom the future belongs, has seldom the time to be scientific.

It seems to me that the proposed National Board of Pharmacy ought to

be composed exclusively of practical pharmacists, store-owners and experienced clerks, at the time of their election and while holding the office actually engaged in the practice of pharmacy. These men are the ideal members for its function of supervising the management of drug-stores. A committee of scientists should be appointed by them to devise the questions for the examinations and also to rate the answers of the candidates, thus conducting the theoretical examination. Practical tests, as dispensing, etc., to test the practical fitness of the candidates, may better be superintended by the board itself. Of course the board members ought also to lay down the governing principles which should guide these scientists, they ought to lay down the lines on which the applicant should be examined, decide what subjects should be touched, how much time the examination should consume and how many questions should be asked, etc. From the questions propounded by the examiners, the board members themselves should select those, which they find most practical and in every way control the examination without themselves being compelled to pose as bird and as fish, as the fine scientists and as practical men. If this would be done many of the complaints so frequently heard about the unfairness of questions would disappear. You would also hear less often complaints of "scientific and unreasonable standards" set in the examination of the purity of drugs as sold in the drug-stores. Examination questions like this would disappear:

Q. What animal drug is an emetic? A. Lard.

No practical pharmacist could devise such a nonsensical question, nor expect such answer.

If the state laws regulating the practice of pharmacy would be remodeled after one uniform pattern, as for instance, Prof. Beal's "Model Draft," at least as far as the power and the functions of the boards are concerned, it would be easy to slip in the rule that it shall be discretionary with the board to license, without direct examination, such applicants as pay the fees and have previously passed another board of the same or superior rigidity. Once this being adopted by the statutes of the various states, the formation and recognition of a national board would not show any more difficulty than the recognition of the Pharmacopœia shows to-day. If some say that the standard of such central board would not suit the various state boards, I would like to answer that as long as such board demands a test which is so rigorous that none of the tests of the various boards is omitted, no one could find good reasons to grumble. If for instance, one board demands the possession of a degree from a college, it would not hurt another board who does not do so, to recognize a man, who has been examined rigorously and found perfectly competent. Would the possession of a degree unfit this man there, because the respective board does not demand such diploma yet? I think not. If one board demands a practical test in dispensing there would not be any disadvantage to some other

board, who does not demand such, to recognize one who has shown proficiency in it. The requirements of the National Board would have to be extremely onerous, of course, in order to include all the various tests of all the existing boards. Only a small number of men, at the start, would be able to qualify before such national board and the less reason for any one to object to the offering of the chance to these few "stars," to practice anywhere in the United States. If a man is willing to pay all the fees and also is extremely proficient, what is the use again and again to re-examine him, whenever he chooses to change his domicile? Some may say, that such competent man would anyway not find difficulties to pass the respective board of any state he would turn to, but could the same man do this so easily thirty years later, when he matured into a fine practical pharmacist, but, alas, has just as naturally forgotten some chemical formulæ and some natural orders? He knows after thirty years' experience all he needs to know and has forgotten what, as a practicing pharmacist, he ought to forget.

How silly it would be to demand of a practicing physician, after thirty years of practice, to again pass a "regent's" examination in preliminary educational topics. We could demand such repeated tests with as much justice as we demand at present such re-examination before a State Board of old pharmacists wanting to settle in another State. If you ask an applicant just passed through college to tell the common name for allyl sulphocyanate he will readily tell you that this is oil of mustard, but could we reasonably demand the same pharmacist to still remember such fact after thirty years? If he runs across a physician who would prescribe this substance under its chemical name he would know where to find this information he may be lacking. He would hunt up the Dispensatory or a chemical book and quickly enough know what he is "up against."

According to the United States Constitution the National Board could not at present be vested with the power to *force* the State Boards to recognize the possessor of its diploma, but we have a Pharmacopœia which also is recognized by the laws of the various States and by their various Boards not because they *must* recognize, but because they *want* to recognize the same.

I claim that the proposed National Board would be speedily recognized by the majority of the various State Boards because of its superior tests, etc.

Another advantage thus gained would be this, that the various colleges of pharmacy would strive to so educate their pupils that they would be able to successfully pass this National Board, who would set up a high standard of proficiency to be aimed at by the various colleges.

Let us work for the coming generation of pharmacists, who ought to find perhaps harder, but fairer, conditions than we found. If we ourselves are not to be benefited by the existence of such newly-created Board, let this not be a reason to handicap the coming generation. If the

pharmacists of the past had not looked at the problem of establishing a national standard, the U. S. Pharmacopœia, in a lofty way, they would have never started at it, and we could not at present reap the fruits of their useful endeavors.

"Ceterum censeo," as Cicero used to say. A National Board of Pharmacy ought to be speedily created.

THE FOUR YEARS' EXPERIENCE PREREQUISITE.

BY J. T. McGILL.

The question, whether four years' experience in a drug-store where physicians' prescriptions are compounded under the direction of a registered pharmacist should be required for graduation, was warmly and fully discussed in the American Pharmaceutical Association several years ago. The advocates of neither side would yield or compromise. Therefore the subject was, it seemed, by common consent dropped, and left for each faculty to settle for itself.

I do not bring up the subject of the four years' experience prerequisite now in order to renew the discussion with reference to its adoption by schools, but with reference to its incorporation into the laws of states in such a way that State Boards of Pharmacy can and do make the recognition of schools of pharmacy as reputable, or of good standing, to depend upon whether it has this requirement for graduation. The usual statement in the law is "Graduates of colleges of pharmacy that require a practical experience in pharmacy of not less than four years before granting a diploma shall be entitled to register without examination." Some, if not all, of the state boards interpret this to mean that a graduate from a school of pharmacy which has not this prerequisite, however well equipped it may be and however thorough its course of study, must stand an examination, even if he has in his hands legal proof of four years of experience taken before graduation; and this all because the faculty of the school does not see proper to make a diploma for scholarship depend upon particular work of unknown quality under some person of unknown character. That is, these boards assume that professors, three-fourths of whom have nothing to do with the drug business, are better capable of judging of the value of practical experience than they themselves are, officers who are in almost all cases men of large practical experience and whose duties include the inspection and regulation of drug-stores. This is discrimination in favor of "experience" schools, regardless of what their standing in other respects may be.

Then, again, in some states the experience clause is interpreted to mean that drug-store experience while at school may be counted. Let me give an example to illustrate how this works. Two young men, A and B, who have worked two years and six months in C's drug-store go off to a school of pharmacy at the same time. A goes to a school of two nine months'

sessions; B to one of two six and a half months' sessions which has in connection with it a drug-store. A puts in his vacation of three months and B his vacation of five and a half months in C's drug-store. B on graduation is registered by the State Board. Two months and a half later A graduates, applies to the State Board for registration, and is informed that he cannot register until he works one year and three months longer in a drug-store. It is not necessary for me to enter into an argument to show that the tendency of this is to bring patronage to the school of shorter sessions; for next to graduation, registration as a licensed pharmacist is the most important event in the early career of a young pharmacist, bringing as it does the endorsement by state authority of his competency to practise his chosen profession, and opening up to him positions of greate responsibility and profit.

If I understand the matter correctly, laws restricting the registration of pharmacists are enacted to protect the public from being supplied by the druggist, or those under his supervision, with dangerous, injurious, or worthless substances as medicines because of ignorance or lack of skill in preparation. The laws are not made for the purpose of preventing failure in business on account of inexperience. In modern schools in which thorough instruction is given, the student not only gains the knowledge of the nature of substances used in medicines, but also acquires in properly equipped laboratories the skill in filling prescriptions and making pharmaceutical preparations, necessary to enable him properly to serve the public and protect it from harm; and he thereby becomes fitted to fulfill the purpose of the law and should be entitled to register. It may not be prudent for him to enter immediately into business for himself, for he may fail; but if he does fail, it concerns neither the law nor the public. For these reasons I do not see the necessity nor propriety of requiring four years' experience in the drug business for registration. In an occupation so important, in which human life is involved, it may be well, as a further safeguard, to add to the laboratory training of the college course one or two years of actual experience in filling prescriptions in the drug-store, but the time spent in drug-stores where prescriptions are compounded is of very little value as a qualification and ought to be eliminated from the requirements for registration.

I have thought it appropriate just at this time to speak of the unfair discrimination in respect to schools that this proviso of four years' experience before graduation causes, and the undue importance given to practical experience in State laws, because, in the first place, the revision of the New York registration law is leading to similar changes in the laws of other States, thus bringing opportunity to remedy defects. In the second place the natural tendency will be to take the New York law as a model. In most of its features it may answer very well as a model, but in some it should not be followed.

In the New York law the old objectionable phrase, "four years' experience where prescriptions are compounded," is used in defining the requirements for the registration of pharmacists. In the announcement of "requirements for registration or accrediting of schools" it is stated that the candidate for graduation in the school must be at least 21 years of age. The First Assistant Commissioner of Education for New York State has written me that a minimum age of 17 years must be required for admission.

I do not believe these requirements should be adopted by other States. Age is not usually made a qualification for admission to a university, but scholastic attainments. While the entrance examination is generally made so difficult that in most cases youths under 17 are not prepared to take it, yet occasionally youths of bright intellect and exceptional advantages are able to stand it, and they should not be rejected. It is not proposed now to make the entrance requirements to schools of pharmacy higher than those to the academic department of a university. But even when graduation in a high school is made a prerequisite for admission to a school of pharmacy, and I see no good reason for this, a youth who has finished the high school course at 16 will have to wait a year to enter a school of pharmacy.

But granting that the age of admission be put as high as 17, it is still not necessary nor advisable to put the age of graduation as high as 21. The required course of two years brings the candidate to only 19 years of age. Now to say that he must wait two years longer to get his diploma (presumably to get practical experience) is to demand of the schools which do not believe in the experience requirements for graduation to come to terms or be discounted in comparison with other schools as far as recognition by New York State is concerned. As long as this judgment is limited to New York State it makes no great difference to schools at a distance. But it will be far otherwise if any great number of States adopt the 21 years' prerequisite.

A school to be considered reputable in Illinois, I believe, must require a standing of 75 per cent. for graduation. A certain per cent. grade should not be made a prerequisite. Success in passing an examination is conditioned upon the quality of the examination as well as the percentage grade required. It is harder to get sixty under some teachers than seventy-five under others. A teacher whose pupils all get over ninety is not the best. The same may be said of a school. The poor teacher and the poor school are the readiest to meet the high percentage requirement.

The Chair stated that paper No. 6 on the morning's program, on "The New Graduation Prerequisite Amendment in Pennsylvania," by Mr. J. P. Remington, was unfortunately not presented at all, and Mr. Remington had apologized for its absence.

Nomination for associate members of the Committee on Education and Legislation were called for, the Chair explaining that the matter had been overlooked at the proper time.

Thereupon Mr. England nominated Mr. George M. Beringer, of Camden, N. J., for one of the three associates, and Mr. Hallberg seconded the nomination. Mr. Boring nominated Mr. W. L. Cliffe, of Philadelphia, but he declined. Mr. Hallberg nominated Mr. J. T. McGill, of Nashville, and Mr. Wilbert nominated Mr. Frank H. Carter, of Indianapolis. Mr. Oldberg nominated Mr. D. F. Jones, of South Dakota, but Mr. Jones withdrew his name. On motion of Mr. Wilbert, nominations were closed, and Mr. Mayo moved that the Secretary cast the ballot of the Section electing Mr. Beringer, of New Jersey; Mr. Jones, of South Dakota, and Mr. McGill, of Tennessee, associate members of the committee, and the motion prevailed. The Secretary cast the ballot, and the Chair declared these gentlemen duly elected.

The Chair announced the installation of officers as the next order of business, but Mr. Mayo moved to dispense with this ceremony, in view of the late hour, and the motion prevailed.

On motion of Mr. Mayo, the Section then adjourned.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION—WEDNESDAY EVENING, SEPTEMBER 6, 1905.

The first session of the Section on Scientific Papers was called to order by Chairman E. H. Gane, of New York, at 8 o'clock sharp, and Mr. Daniel Base, Associate on the Committee, was called to the Chair while Mr. Gane read his address:

A PLEA FOR GREATER ATTENTION TO THE SCIENTIFIC NEEDS OF THE BUSINESS PHARMACIST.

In selecting the subject-matter for the annual address to this Section I have been influenced mainly by the steadily decreasing interest taken by the great body of pharmacists in the work of our Association. While I do not agree with the gentleman who stated at one of the State Association meetings that the American Pharmaceutical Association was in danger of dying of dry-rot, I do think that to some degree we have, as it were, reached a "parting of the ways," where it becomes necessary for us to pause for the purpose of determining whether this Association shall represent only the purely scientific side of pharmacy and rest content with a small membership, or whether it be not possible to combine our scientific work with the commercial applications thereof, so as to secure recognition from the great mass of business pharmacists.

A WEAK SPOT SOMEWHERE.

We cannot look back over the past record of this Association, and of this Section in particular, without a feeling of pride in its achievements for the advancement of the scientific side of pharmacy. But, while taking pride in its scientific achievements, we must not lose sight of the fact that science is of value to the pharmacist only so far as he can make practical application of it. In other words, we must not forget that pharmacy is not in any sense a pure science. It is not confined merely to knowledge of chemical and botanical substances. It includes the practical applications of nearly all chemical and vegetable substances to medicine and to the arts. It should be one of the greatest of applied sciences, and the pharmacist should occupy as high a position as the physician or the chemist. The fact that he does not shows that somewhere in our organization there is a weak spot. In older countries this lack of recognition was attributed to the fact that universities did not recognize pharmacy as worthy of inclusion in their course of study, but this reason fails us when we consider the numerous departments of pharmacy attached to our own universities.

The appeal has frequently been made for more investigations by pharmacists in pure

science. This appeal has not been disregarded. Indeed, the tendency of pharmaceutical investigations of late years has been more and more in that direction, and to some extent this is responsible for the lack of interest displayed by the rank and file of pharmacists. Not that I wish for a moment to disparage such work; investigations in pure science are a necessary part of the work of this section. But side by side with investigations in pure science we need to give more attention to the problems confronting the practical pharmacist which require for their solution the aid of our scientific investigators. What hope is there of securing due recognition of the applied science of pharmacy when the perhaps more fascinating field of pure science attracts most of our most capable workers?

THE SCIENTIFIC CHARIOT IS BEING DRIVEN TOO FAST.

We are tending too much toward the ultrascientific in the work of this section, thus creating a wide gap between the great body of pharmacists and the few to whom they should look for guidance and assistance. We are going ahead too fast for the business pharmacist and assuming too much interest on his part in scientific studies to the neglect of the latest advances in galenical pharmacy.

The new Pharmacopœia strikingly illustrates the truth of these statements. Its chemistry, its botany, its pharmacology show that the revisers have closely studied the latest advances in those sciences, so that little exception can be taken to that portion of the work, but it does not reflect progress in galenical pharmacy. It even exhibits a tendency to follow a section of the medical profession in taking part of its pharmacy from the advertising publications of certain proprietary remedy manufacturers. It may be argued that this is only a reflection of existing conditions in pharmacy, but even so the wisdom of giving it official sanction is doubtful in these days of exactitude in science. The inevitable tendency will be to concentrate the whole of the scientific part of pharmacy in the hands of the manufacturers, thus diverting the interest of pharmacists from pharmaceutical research.

WHAT AMERICAN PHARMACY NEEDS TO-DAY

Is a revival of interest in strictly pharmaceutical problems. True, we have a Section devoted to Practical Pharmacy, but the average pharmacist lacks the necessary time and training to pursue scientific problems to a satisfactory conclusion. This work can only be performed properly by those interested in the work of this Section. There are many problems awaiting solution which this Section could consider without in any way compromising the dignity which rightly surrounds it. A glance at the literature of pharmacy during the last few years shows that progress in pharmacy is practically at a standstill in this country. The era of proprietary specializing may have something to do with this state of affairs, but it is undoubtedly aided by the preference of investigators for the field of pure science. And yet, even in connection with the commonest of pharmaceutical preparations there is much research of a scientific character needed. Under existing conditions the ultimate benefit from such researches will go to the manufacturer and not to the pharmacist, but there is still enough pharmaceutical research left and enough in the latest developments of the science and art of healing to prevent the pharmacist from becoming a mere dealer in manufactured specialties.

A REMEDY SUGGESTED.

It is to this section that the pharmacist looks for relief. We need to adopt a more aggressive attitude in dealing with pharmaceutical problems. We have been too prone to bow before the chemist on the one hand and the physician and the surgeon on the other, and to be kicked by both. The pharmacist should lead in knowledge of drugs, their behavior and the best methods of presentation. It should be his part to make practical applications of the results of scientific research, to aid in replacing crude drugs by

definite principles, and to urge the abandonment of unscientific and inert products. Individually he can do little, but definite action by this Association in coöperation with the American Medical Association should do much to restore his prestige. The suggestion made some years ago by the special Committee on Research to the effect that this association co-operate with the American Medical Association received no attention; hence we have the appointment by that body of a Council on Pharmacy and Chemistry, which is a distinct reflection on the work of this section. The fact that most of the members of the new Council are leading members of this Association shows that we have not been alive to our opportunities. It would seem that work of the kind initiated by the American Medical Association should at least have been done after consultation with this section, if not in direct conjunction with it. The present agitation affords us an opportunity to get in closer touch with the American Medical Association. Unless guided aright the latter body may do much harm to the cause of pharmacy, and this Section should take steps even at this late date to coöperate with the American Medical Association in any investigations the latter may undertake, which are of direct pharmaceutical interest. As experts in the science and art of pharmacy we should be quick to prevent or to resent the usurpation of our functions either by the medical profession or the chemist. As above indicated, progress will be slow if left to individual workers. We need to follow the tendency of the times and coöperate in our work. Many scientific bodies to-day adopt the plan of holding symposia on given subjects from time to time. This idea has many advantages. If adopted by us it would systematize to a large extent the work of this section, render it more interesting to the business pharmacist, because more definite results are thus obtained, and it would in particular aid the revisers of future editions of the United States Pharmacopœia. It would not, moreover, interfere with the work of individuals, and its good results have already been exhibited in the reports of the Special Committee on Indicators and the coöperative work on opium assays.

The By-Laws of the Association instruct the officers of this Section to prepare a list of suitable subjects for investigation. This instruction has been more honored in the breach than in the observance thereof, because each worker has been free to follow the line of investigation in which he is especially interested, and this frequently has been of little direct pharmaceutical interest. With the adoption of the co-operative idea it would be possible either for the officers of this Section or for a special committee not only to prepare a list of practical subjects for discussion, but to select the investigators best fitted to carry out the work. It should not be difficult to select some subjects which would induce business pharmacists to interest themselves in the work.

SCIENTIFIC SIDE LINES FALLING INTO OTHER HANDS.

Perhaps the greatest advance of recent years has been the application of physical methods to chemical research. It is a branch of chemistry which has already produced brilliant results, and it is a side which is bound to develop more and more every year. It would seem that more attention should be paid to physical problems, not only in our schools of pharmacy, but in the contributions offered to this Section. Already certain discoveries in physical science are being applied to medical purposes, and here and there a pharmacist has been quick enough to see the business possibilities therein, but it should be the duty of the leaders in this Section to point out to their *confrères* the application of these discoveries to pharmacy. One by one what I may call the legitimate scientific side-lines of pharmacy have passed into other hands through lack of proper information from sources that should guide the business pharmacist.

But by far the most important work confronting us in the immediate future is the question of food and drug adulteration. The vicious attacks of certain proprietary medicine interests through the daily press and the outcry on the part of ill-informed pure food and drug fanatics are to some extent undermining public confidence in the pharmacist.

Among the fundamental objects for which this Association was founded was to secure purity in drugs and chemicals, to suppress empiricism and to confine the sale of medicines to regularly qualified apothecaries. Of late years little has been done in this direction until the appointment at the St. Louis meeting of the Special Committee on Drug Adulterations. The committee has been continued from year to year by the chairman of this Section, but without regular authorization. The results which have been already reported would seem to warrant its continuance as a standing committee of this Section. If the work be continued upon the lines inaugurated by Professor Patch, it can be made one of the most powerful influences for the good of the Association, the benefit of the retail pharmacist and the general public. It is the commencement of the first systematic attempt to determine to what extent adulteration of drugs and chemicals is practiced, and it is gratifying to note that some of the State associations are doing similar work.

The widespread agitation regarding adulterated drugs is to some extent manufactured either for personal or political ends. That adulteration exists we know, but to what extent we do not know, nor do those who are engaged in fostering the agitation, but it is a serious menace to pharmacy in that it represents an organized attempt to take away from pharmacists the control of pharmaceutical products. Such an attempt should be resisted by every means in our power.

DANGER FROM OFFICIAL CHEMISTS.

In an effort to find out what knowledge is possessed by those State officials and chemists who aid in fomenting the question, a letter was addressed to the principal officials of those States which have commissions devoted to food and drug examination, asking whether any systematic effort had been made to ascertain to what extent adulteration of drugs was practiced. The further question was asked by what standards the purity of drugs and chemicals was determined. The replies show that in only two or three States has any attempt been made to ascertain facts. Most of the officials state frankly that no work has been done, in some cases from lack of appropriations, in others because they have no direct power, and in some because food work takes up all the time of the chemists. It is instructive to note that many of them express the hope of obtaining legislation and appropriations in the near future. Some vaguely state that there is no doubt that adulteration of drugs is practiced to a considerable extent. The replies to the question of standards show that the United States Pharmacopœia is taken as the standard for drugs mentioned therein, but in other cases the standards are arbitrarily fixed by the officials themselves. It is obvious, therefore, that we must be on the alert to avert danger from this source. Already, in spite of warnings, control of drugs and pharmaceutical products has, in at least one State, passed out of the hands of pharmacists. This is largely due to lack of systematic work on our part. We have already pledged the support of this Association to the Bureau of Chemistry in the work they are undertaking, and this support should be material and not merely consist of abstract resolutions. At present we are leaving to chemists, State and Federal officials, work that should be done by ourselves, and we are allowing positions that could and should be filled by pharmacists to be filled by graduates from technical schools and universities, who formulate what have been called "arm-chair standards," and who indulge in "yellow chemistry." The fixing of standards of purity properly belongs to this Section, and should form part of our work, either through a special committee or through the Committee on the Drug Market. It should not be left to the pure chemist, for the latter lacks the practical pharmaceutical knowledge and commercial experience which is necessary for the proper formulation of standards.

A QUESTION OF DIRECT INTEREST.

One of the questions directly of interest to the drug trade is that of the use of anti-

septics or preservatives and coloring matters in foods and drugs. Manufacturers on the one side and chemists on the other are fiercely debating the subject, and we are apparently patiently awaiting the result. Is not this a matter in which our particular expert knowledge should be of service? Is it not distinctly a pharmaceutical and medical question? We might well appoint a committee first, to determine whether such adventitious aids are necessary to the proper preservation of foods and drugs, and later, if an affirmative answer be given, to confer with a similar committee of the American Medical Association to determine what coloring matters and preservatives may be classed as harmless and in what proportion they may be used to secure the desired result without detriment to the public health. This would give us additional opportunity to get in close touch with the leaders in medicine. It is a subject that should not be left to State and Federal officials to determine arbitrarily.

THE SECTION AS A SOURCE OF EXPERT ADVICE ON SCIENTIFIC SUBJECTS.

The agitation by this Association of the "coaltar creosote" question has already born good results in stopping the sale thereof except under proper precautions. More speedy results would have been obtained had definite action followed the passage of resolutions. Action should be taken by us against the increasing use of wood alcohol in pharmaceutical and household preparations. Recent researches seem to show that methyl alcohol even in its purest form is a dangerous drug when taken internally. The American Medical Association passed a resolution condemning its use, and this section, through the Committee on the Drug Market, should take steps to prevent the sale of the article except under proper precautions. True, we have no legal powers, but the influence of this body is powerful enough if properly exercised to induce at least the majority of manufacturers to follow our advice. Continued action of this kind would ultimately lead the trade to look to this section for expert advice on scientific questions.

The American Chemical Society is giving considerable study to the question of purity in chemicals used for analytical and research work, and will attempt to formulate standards of purity and later to authorize a series of labels by which manufacturers may designate their products, according to the degree of purity and freedom from particular impurities. Is it not equally incumbent upon this Association to formulate standards of purity for unofficial chemicals and drugs used in medicine and for household purposes, not only for the protection of the public, but to protect the pharmacist against unjustifiable prosecution under pure food and drug laws. The Committee on the Drug Market has already started this work consequent upon prosecutions instituted by the Massachusetts State officials for selling unofficial products which did not conform to their arbitrary standards. Unless we take a more active interest in questions of this kind, about the only work of scientific import of direct pharmaceutical interest left for us to do will be to furnish aid in the revision of future editions of the Pharmacopœia.

THE DUTY OF THE PHARMACIST.

The powers of the Committee on the Drug Market should be enlarged, and while keeping a watchful eye to detect variations from established standards of purity in drugs and chemicals, its work might well be extended to prevent the sale of many of the utterly fraudulent products offered to the general public to-day. We secure special privileges on the sole ground that the public needs protection from inexpert dealers. Is it not, therefore, part of our duty to protect the public from the impositions of those who seek to exploit fraudulently the latest achievements in medicine or science? The legal part may be left to the properly constituted authorities, but the exposure of such is properly part of our work. It should not be left, as it mainly is, to newspaper and magazine editors in search of sensations. The scientific portion of the work belongs to this section, the rest would form part of the work of our newly established Committee on Pub-

licity. By agitation of this kind we do not compromise our dignity to any degree, but we do show that the pharmacist is a person who has as definite a sphere of action as the physician or the chemist. We should seek not to pose as scientists in the strict sense of the term, but as experts in everything pertaining to drugs and medicines. More we do not need as pharmacists, with less we would fail to do our whole duty to the public.

By establishing our position in this way, we should be in a position to aid the agitation, already started in some quarters, for representation upon our State Boards of Health and upon food and dairy commissions, and, incidentally, aid in the control of the proprietary medicine business, which is recognized as one of the worst evils confronting pharmacy. Pharmacists have in this country opportunities presented which pharmacists of no other country possess, and we have only ourselves to blame if we fail to grasp at least some of them.

Conditions in pharmacy at present warrant some departure from past customs. Some of the suggestions made in this address will doubtless appear to many rather iconoclastic. They are not made with any idea of getting the section to take definite action thereon immediately, but in the hope of creating discussion and arousing the interest of pharmacists generally in the affairs of this Association.

The address of the Chairman was greeted with hearty applause, and Mr. E. H. Bartley, of Brooklyn, moved to receive and refer for publication, and the motion prevailed.

Mr. Chas. Caspari, Jr., called attention to the fact that there were some recommendations in the address, and Mr. Bartley moved to refer the recommendations to a special committee of three, for consideration, and report at the next session. This motion was seconded by Mr. Puckner, and carried, and the chair appointed on such committee Messrs. W. A. Puckner, E. H. Bartley, and Leo Eliel.

Mr. Gane resumed the chair.

The Chair called for a report from the Committee on Ebert Prize, and Mr. Rusby, chairman, submitted the following:

REPORT OF COMMITTEE ON THE EBERT PRIZE.

Gentlemen: Your committee appointed by the chairman of the Section on Scientific Papers beg leave to report that they have carefully examined the many excellent papers presented at the last annual meeting, and would recommend that the Ebert Prize for the past year be awarded to Prof. Dr. Ernst Schmidt, of Marburg, Germany, for his paper entitled "Concerning Choline, Neurine and Allied Compounds."

Respectfully submitted for the Committee,

H. H. Rusby, *Chairman.*

On motion of Mr. Main, the report was received and the recommendation adopted.

Mr. Lyman F. Kebler made the following report for the Committee on Drug Market, in the absence of Mr. E. L. Patch, chairman.

REPORT OF COMMITTEE ON DRUG MARKET, 1905.

The table accompanying our report will give the results obtained by the various members in their examination of products during the past year and such interesting published results as have come to our notice. To a certain extent articles found of satisfactory

quality are included. It has come to our attention that great variation exists in the methods and plans of work adopted by the Boards of Health of the different States. The majority of the States are not doing any systematic work in the investigation of drug adulteration. In many the laws cover dairy products and foods only. It is very creditable that in such States the only work being done is that of committees of the State Pharmaceutical Association.

Some who do consider drug-adulteration appear to be largely concerned in checking real and intentional infringements of the law, while others may select unimportant products which are measured by arbitrary standards and give results that misrepresent the pharmacist and excite unfair suspicions in the public mind. It would be very desirable if the General Secretary of the Association would correspond with the Secretaries of the Boards of Health of the several States, keep informed as to work being done, secure their reports as soon as published and place them at the disposal of the Committee on Drug Market. From careful inspection of these reports the products causing most annoyance could be selected and the attention of pharmacists called to them, thus putting them on their guard and largely diminishing the cause for complaint. Many of the State Associations have Committees on Adulteration, and it would be very helpful if their work could be made available for the report of this committee.

Over thirty letters sent out to various manufacturing houses, asking for reports upon the quality of market products as evidenced by their examination, have not secured a single response for this report.

Our Association, national in character, should find some way of securing extended co-operation along all these practical lines, and become a valuable clearing-house for all the scientific and educational work of American pharmacy, quite as potent as the N. A. R. D. has become along trade lines. The large amount of correspondence involved cannot well be undertaken by the individual chairmen of committees, but should be performed by the proper paid official, who should put the material obtained into the hands of the various committees for their consideration and report.

The "Chemist and Druggist" for March 11, 1905, calls attention to the continued presence of lead in many chemicals in spite of the number of prosecutions that occurred during the previous year. While so marked a condition has not been found to exist in the United States, yet it is not infrequent to find the presence of lead in citric acid, citrates of alkalies and some other salts. The article by Prof. Rusby in the "Pharm. Era" of May 18, 1905, gives a vivid exhibit of the condition of the crude drug market. To quote briefly:

Grindelia robusta and squarrosa sold from the same bale.
Jamaica sarsaparilla sold for Honduras.
Larkspur seed sold for stavesacre.
One angelica for another.
Spurious horehound for the genuine.
Laurel leaves for myrica.
One scullcap for another.
Walnut for butternut.
Different species of apocynum substituted for each other.
Less than half the male fern genuine.
Seventy-five per cent. of pink root spurious and the adulterant worthless.
Spurious quebracho, or bark with the inner alkaloid-bearing portion removed.
False chiretta.
Bark of cotton stem instead of root.
Matico leaves and winter's bark spurious.
Spurious stramonium seed, free from mydriatic power.
Poor quality of henbane from first year's growth.

It might be well to in some way call the attention of all the State Boards of Health to the pharmacopœial statements: that "The purity standard requirements which limit the quantity of innocuous impurities are, unless otherwise specified, to be understood as applying to chemical substances which are free from adherent moisture, but an allowance not exceeding three per cent. of moisture is permitted in non-hygroscopic crystallized chemical salts. Chemical substances in the form of powder or capillary crystals and all hygroscopic salts are to be dispensed in a condition of sensible dryness. As long as this condition is fulfilled, the moisture present is not to be regarded as an impurity;" and "Inasmuch as there has existed in the past on the part of the public a misconception of the purposes of a pharmacopœia, and penalties have been imposed upon those who have sold substances bearing pharmacopœial names which were to be used in the arts for manufacturing and other purposes, and not as medicines, it has become necessary to make the following declaration:

"The standards of purity and strength prescribed in the text of this Pharmacopœia are intended to apply to substances which are used solely for medicinal purposes and when professedly bought, sold, or dispensed as such."

It is a question whether the requirement that no effloresced salts should be dispensed is a safe weapon to be entrusted to the hands of some examiners. While the statement: "The standards of purity and strength prescribed in the text of this Pharmacopœia are intended to apply to substances which are used solely for medicinal purposes and when professedly bought, sold or dispensed as such," will be a relief to the trade from many annoyances, it may in some cases necessitate carrying two grades of unimportant products and require careful inquiry as to the intended use of the article called for.

It would be an advantage if a change could be brought about in the method of making reports now in use by the authorities. It is misleading, and prejudices the public to report deficient products as adulterated. To report fifty samples of spirit of nitrous ether weak in nitrous ether, supplied by four manufacturers, as fifty cases of adulteration, creates a wrong impression.

Comp. spirit of ether and ethereal oil have been official for fifteen years, yet the great majority of manufacturers do not and never have supplied either official. The retail pharmacist purchases the products of these houses, often labeled U. S. P., and every sale he makes incurs liability under the law. In this instance ignorance and veniality may both be factors, and it may be just for the dealer to suffer, but there are many cases where changes beyond control may impair the strength and bring about a deficiency that in no just sense should be named an adulteration. Where the law so names it an amendment should be secured.

In view of the disastrous consequences that have followed the use of wood alcohol and its increasing use in flavoring extracts, proprietary medicines, toilet waters, bayrums, witch hazel, etc., we suggest that the Association pass the following resolution:

Resolved, That the American Pharmaceutical Association earnestly condemns the use of any form of wood alcohol in any pharmaceutical or proprietary preparation, whether designed for internal or external medicinal use, or to be applied as a toilet lotion.

Respectfully submitted,

EDGAR L. PATCH,
CHAS. H. LAWALL,
WILLIAM K. ILHARDT,
THEODORE D. WETTERSTROEM,
LYMAN F. KEBLER,
L. D. HAVENHILL.

CONDITION OF MARKET.

Name.	*Impurity.*	*Report.*
Acid Acetic.	Contained chloride, sulphate and lead.	L. Kebler.
Acid Acetic.	3 samples: 37 per cent., 38.2 per cent. and 38.7 per cent. sold as 36 per cent.	W. K. Ilhardt.
Acid Boric, C. P.	Contained phosphate and trace of magnesium.	L. Kebler.
Acid Boric, C. P.	5 lots O. K.	E. L. Patch.
Acid Boric, C. P.	Common. Contains calcium and sulphate.	E. L. Patch.
Acid Citric.	Contained lead.	L. Kebler.
Acid Citric.	One sample lead and iron.	E. L. Patch.
Acid Citric.	10 lots, traces of iron and sulphate. Averaged 99.5 per cent. pure.	E. L. Patch.
Acid Hydrochloric, C. P.	Contained free chlorine.	L. Kebler.
Acid Molybdic, C. P.	Contained nitrate, chloride, sulphate and ammonia compounds.	L. Kebler.
Acid Molybdic, C. P.	Contained nitrate, chloride, sulphate and sodium salt. Assayed 82.5 per cent. pure.	L. Kebler.
Acid Oxalic.	Contained traces of nitric and sulphuric acids and iron.	E. L. Patch.
Acid Phosphoric.	Contained traces of iron and silica. One lot mostly meta-phosphoric acid.	E. L. Patch.
Acid Salicylic, C. P.	Contained carbolic acid and other foreign organic impurities.	L. Kebler.
Acid Salicylic, C. P.	One sample contained phenol.	L. D. Havenhill.
Acid Sulphuric, C. P.	Contained lead and iron.	L. Kebler.
Acid Tannic, U. S. P.	Contained much resinous matter.	L. Kebler.
Acid Tartaric.	One barrel gave tests for copper. 20 barrels gave iron and sulphate beyond U. S. P. limits. Averaged 99.5 per cent. pure.	E. L. Patch.
Alcohol Amylic.	Contained petroleum from use of petroleum barrels.	L. Kebler.
Alcohol, Ethyl.	Contained foreign organic matter and was excessively acid.	L. Kebler.
Alcohol, Methyl.	117 out of 2,121 samples of pharmaceutical or 5.51 per cent. contained wood alcohol. N. Y. Board of Pharmacy.	E. L. Patch.
Alcohol, Methyl.	8 proprietary preparations for external and internal use all contained wood alcohol.	T. Wetterstroem.
Ammonium Bromide.	Sample labeled U. S. P. assayed 95.3 per cent.	E. Gane.
Ammonium Bromide.	Of 21 samples, 13 contained excess of chloride, 4 dirt, 6 metallic impurities. Only 2 official.	C. E. Caspari.
Ammonium Carbonate.	Traces of chloride and sulphate.	E. L. Patch.
Ammonium Chlorid Purif.	Contained aluminum and copper.	E. L. Patch.

Aristol.	Of 139 samples examined in Chicago, 23 were spurious, 66 were 20 per cent. pure, 10 were 80 per cent. pure, 9 were 90 per cent. pure and 31 pure. Am. D. 1904—423.	
Arnica Tincture.	2 lots contained wood alcohol.	Chas. H. LaWall.
Arnica Tincture.	7 samples free from wood alcohol.	T. Wetterstroem.
Arrowroot.	Contained potato starch.	E. L. Patch.
Asafetida.	45 per cent. sand, balance fine grade tears.	E. Gane.
Asafetida.	62 per cent., 62.5 per cent. and 73.3 per cent. insoluble in alcohol.	E. L. Patch.
Barium Hydrate, C. P.	Contained fragments of hay, wood and paper; also chloride and carbonbonate.	L. Kebler.
Bay Rum.	Of five samples from barber's supply houses, four contained from 31.5 to 48.5 per cent. wood alcohol and artificial color.	T. Wetterstroem.
Beeswax.	Of three samples of yellow one was pure, two impure. Of two samples of white, impure, one 98 per cent. paraffin.	T. Wetterstroem.
Beeswax.	Of 11 samples of yellow, four only met U. S. P. 1890 requirements for fusing point and sp. gr. Two samples of white fused at 62° C. instead of about 65° C.	L. D. Havenhill.
Calamine, Commercial, free from zinc.	Is a clay colored with iron.	E. L. Patch.
Calcium Carbonate Precip.	Contained 2.1 per cent. insoluble in dilute acids. Contained sand, iron, chloride.	E. L. Patch.
Calcium Oxide, C. P.	Contained siliceous matter, aluminum, iron and chloride.	L. Kebler.
Calcium Phosphate Precip.	Contained iron and chloride.	W. K. Ilhardt.
Calomel.	Four samples all contained trace of corrosive sublimate.	L. D. Havenhill.
Calomel.	157 samples, 82 minute quantites of corrosive sublimate, 75 absolutely pure.	C. E. Caspari.
Capsicum.	Three samples free from starch and earths. 5.1 to 6.1 ash. True to name.	T. Wetterstroem.
Charcoal, Animal, C. P.	Contained uncarbonized material.	L. Kebler.
Chloral Hydrate.	Melting-point 51° C. Contained chloride and chloral alcoholate.	L. Kebler.
Clove, Ground.	Contained wheat starch.	Chas. H. LaWall.
Cobalt Nitrate, C. P.	Contained sodium chloride and calcium sulphate.	L. Kebler.
Cochineal.	26 per cent., 27 per cent., 28 per cent., 29.4 per cent., 34 per cent., 41 per cent., 46 per cent.	E. L. Patch.
Cochineal.	30.5 per cent. ash, mostly barium sulphate.	L. D. Havenhill.

Cochineal.	39 per cent. ash, tinctorial power ½ normal.	L. Kebler.
Colors, Imported.	Labeled "Of plant origin." Contained coal-tar dyes.	L. Kebler.
Copaiba.	Adulterated with gurjun balsam.	W. K. Ilhardt.
Copaiba, Para.	84 per cent. volatile oil. An unusually high percentage. Resin hard and brittle. All the properties of genuine copaiba resin.	E. Gane.
Copaiba, Para.	Five samples, one U. S. P. 3 contained gurjum balsam, one fictitious.	T. Wetterstroem.
Copaiba, Para.	Ten samples Para, 31 to 48 per cent. resin. Average 40 per cent. U. S. P. 1900 standard 50 per cent.	E. L. Patch.
Cream of Tartar.	Adulterated with corn starch.	E. Gane.
Cream of Tartar.	Three samples, all impure. Contained 0.28 per cent. calcium tartrate. Were 97.2 per cent., 98.5 per cent., 98.8 per cent.	T. Wetterstroem.
Digitalis.	Powdered drug adulterated with verbascum leaves. Am. Dr.	E. L. Patch.
Dithymol Diiodide.	Ash, 5.61 per cent. Insoluble in ether, 9.83 per cent. Insoluble in chloroform, 4.44 per cent.	L. Kebler.
Drugs, Powdered.	Diluted with powdered almond shells. Pharm. Centralh.	L. Kebler.
Elm Bark.	Nine samples. Two heavily adulterated with wheat starch.	L. Havenhill.
Ether, Acetic.	Contained calcium chloride. Otherwise O. K.	L. Kebler.
Extract Lemon.	Four samples contained over 40 per cent. wood alcohol. Mass. State Board of Health.	E. L. Patch.
Florida Water.	Barber's supply house, 49.24 per cent. wood alcohol and artificial color.	T. Wetterstroem.
Formaldehyde.	Eleven samples ranged 29 per cent. to 37 per cent. by weight, 30.8 per cent. to 39.8 per cent. volume. Three below 37 per cent. volume.	T. Wetterstroem.
Fruit Juices.	Salicylic acid and coal-tar dyes.	L. Kebler.
Gelsemium, Powdered.	Gave 15.13 per cent. ash, two-thirds of which was sand.	L. D. Havenhill.
Ginger Extract.	Made with wood alcohol. Caused death of one person.	L. Kebler.
Hydrogen Dioxide Sol.	Contained 0.560 sodium arseniate per litre. Am. D., 1905, 321.	E. L. Patch.
Hydrogen Dioxide Sol.	Four samples assayed 2.26 per cent., 3.25 per cent. 3.15 per cent., 3.14 per cent. Acidity, 0.4 Cc., 0.37 Cc., 0.33 Cc., 0.33 Cc., vol. KOH.	T. Wetterstroem.

Insect Powder.	Adulterated with powdered hellebore and powd. sumach bark. Much inferior powder offered containing a large proportion of stalks and little floral tissue.	E. Gane.
Iodeosin (Erythrosin).	Contained 50 per cent. of common salt.	L. Kebler.
Iodine, Tincture.	7.74 per cent., 5.59 per cent., 2.81 per cent., 3.25 per cent., 3.96 per cent., 1.4 per cent., 2.83 per cent., 1.42 per cent. of iodine. No. 1 made with wood alcohol.	Chas. H. LaWall.
Iodine, Tincture.	5.7 per cent. iodine.	W. K. Ilhardt.
Ipecac.	Root of Richardsonia scabra used as adulterant. Also root of Heteropteris pauciflora. Neither contain any emetine. The last is free from starch and calcium oxalate present in true ipecac.	E. Gane.
Iridium Chloride.	A wonderful therapeutic agent, sold at $5.00 per ounce. Is an ammoniochloride of iron worth two cents per ounce.	E. L. Patch.
Jalap.	1000 lbs. gave 8 per cent. resin.	E. Gane.
Lard.	75 per cent. cottonseed oil and 10 per cent. hard beef fat.	L. Kebler.
Lard.	Sixty-three samples: 27 impure; 36 pure. Ohio D. and F. Com.	T. Wetterstroem.
Lead Acetate, Pure.	Badly carbonated. None corresponded perfectly with U. S. P., 1900.	E. L. Patch.
Licorice Powder Compound.	Contained ground olive stones.	L. Kebler.
Lime Water.	0.098 per cent. $Ca(HO)_2$.	W. K. Ilhardt.
Lime, Chlorinated.	Samples in tins, 21 per cent. to 26 per cent. Fresh bulk goods, 33 per cent., 37 per cent., and one American brand, 42 per cent.	L. Kebler.
Linseed Meal.	Personally ground, gave 34.2 per cent. oil. Sample from wholesaler, 21.8 per cent.; manufacturer, 21.8 per per cent.; manufacturer, 25.7 per cent.	T. Wetterstroem.
Mace.	No. 1 contained Bombay or wild mace, 47.7 per cent. ethereal ext., No. 2 do. 48.3 per cent. ethereal extract.	Chas. H. LaWall.
Magnesium Carbonate.	44 to 51 per cent. carbonate, trace calcium.	E. L. Patch.
Manganese Dioxide.	Contained sodium chloride, calcium and magnesium, 70 per cent. pure.	L. Kebler.
Mercurial Ointment.	50 per cent. mercury, 28.5 per cent. free, 1.5 per cent. combined, 70 per cent. petrolatum. Mercury, 48 per cent.; lard and tallow, 51.8 per cent.; petrolatum, none.	T. Wetterstroem.

Mercurial Ointment.	Mercury, 25.5; lard and tallow, 75.4; petrolatum, none. Mercury, 48.6; lard and tallow, 37.4; petrolatum, 7. Mercury, 33; lard and tallow, 47; petrolatum, 20. Mercury, 48.7; lard and tallow, 34.3, petrolatum, 17. Mercury, 32.8; lard and tallow, 67.2.	
Milk Sugar.	No. 1. C. P. solubility, 1 in 11.4; lactose, 99.5; ash, 0.17. No. 2. Com. solubility, 1 in 11.7; lactose, 96. No. 3. C. P. solubility, 1 in 11.7; lactose, 99.5; ash, 0.04. No. 4. Com. solubility, 1 in 12.7; lactose, 97; ash, 0.18.	T. Wetterstroem.
Morphine Tablets.	Varied widely from labeled strength. Contained cane sugar instead of milk sugar, as labeled.	L. Kebler.
Musk, Artificial.	Had 25 per cent. acetanilid.	E. Gane.
Mustard.	Adulterated with turmeric-colored wheat-starch.	L. Kebler.
Nitrous Ether Spirit.	1.53 per cent., 1.74 per cent., 1.53 per cent., 1.67 per cent., 2 per cent., 2.3 per cent., 1.35 per cent., 0.21 per cent., 2.4 per cent., 0.9 per cent., 1.24 per cent., 1.16 per cent., 2.4 per cent., 2.25 per cent., 2.07 per cent., 0.15 per cent., 0.87 per cent., 1.09 per cent.	Chas. H. LaWall.
Oil Almonds, Expressed.	Peach-kernel oil, 20.8 per cent.; sugar, 55.4 per cent.; water, flavored and colored, 23.8 per cent. C. & D., 1905.	L. Kebler.
Oil Castor.	Samples from drug-stores all pure; from grocers all impure. La. Ph. Assoc. Proc.	E. L. Patch.
Oil Cod-liver.	Adulterated with oil from coal-fish, haddock, ling and cusk. 10 per cent. cannot be detected. Spat., Oct., '04.	E. L. Patch.
Oil Cod-liver.	Acidity as oleic acid. Fresh Norwegian, 0.516 to 0.680. Old, 1.19 to 2.87. Fresh Newfoundland, 0.550 to. 0.825. Old, 3.01 to 4.52. Seal oil, 0.75.	E. Gane.
Oil Cod-liver.	Six lots Norwegian. Sp. gr. at 15.5° C., 0.9267; opaque at 10° to 11.7° C.; Sapon. No., 181–188.2; Iodine No., 137.8–150; Refractometer, 84.4–85.5.	T. Wetterstroem.

Oil Cod-liver.	Four lots Newfoundland. Sp. gr. at 15.5° C., 0.9256; opaque at 0° to 10° C.; Sapon. No., 185.9–195; Iodine No., 128.5–147; Refractometer, 81.6–84.2.	
	Twelve other market samples. 11 cod-liver oil; 1 contained seal oil.	
Oil Cod-liver.	Seldom does American cod-liver oil of known purity comply with all U. S. P. requirements.	L. Kebler.
Oil Cod-liver.	Twelve samples wine of cod-liver oil. All below standards.	T. Wetterstroem.
	Only three contained a trace of cod-liver oil. Ohio D. and F. Com.	
Oil Eucalyptus.	Contained castor oil.	E. Gane.
Oil Lemongrass.	Frequently adulterated or substituted with oil citronella.	E. Gane.
Oil Linseed.	Sixty samples. 58 pure, 2 adulterated.	Chas. H. LaWall.
Oil Linseed.	Forty-three samples. 10 pure, 33 adulterated. Ohio D. and F. Com.	T. Wetterstroem.
	Six samples. 2 pure, 1 largely mineral oil, 1 contained resin oil, 2 a mixture of resin oil and mineral oil.	
Oil Olive.	Certified pure by different analysts. Contained 17.5 per cent. peanut oil.	L. Kebler.
Oil Peppermint.	Sp. gr., 0.903. Rotation, 16°. Not soluble in ten volumes of 70 per cent. alcohol. Contained cedar-wood oil and fixed oil to 10 per cent.	E. Gane.
Oil Peppermint.	Last year's distillation of Western oil was low in sp. gr., 0.89 per cent. to 0.898. Otherwise satisfactory. Rotation, 31° to 32°. Menthol, 56.29 per cent. to 60 per cent.	E. Gane.
Opium, Gum.	Moisture, 22.2 per cent.; morphine, 9.28 per cent., U. S. P. 1890.	T. Wetterstroem.
	Moisture, 5.78 per cent.; morphine, 13.34 per cent., U. S. P. 1890.	
	Moisture, 33.9 per cent.; morphine, 7.46 per cent. U. S. P. 1890.	
Opium, Powdered.	Morphine, 14.4 per cent.; U. S. P. 1890.	
	" 13.8 " " "	
	" 12.5 " " "	
Opium, Tincture.	Fifty samples. Two contained wood alcohol. Assayed by 1890 process. Two 0.3 per cent. or below; three 0.6 per cent. or below; twelve 0.9 per cent. or below; four 1.0 per cent. or below; nine 1.2 per cent. or below; six 1.3 per cent. or below; fourteen above 1.3 per cent. Weakest, 0.2; strongest, 1.568. Average of fifty 1.036.	T. Wetterstroem.

Opium Tincture.	Assayed 0.68 instead of 1.3. Mass. St. B. of H.	E. L. Patch.
Paraldehyde.	100 Cc.=0.533 non-volatile matter. Congeals at 10° C. (U. S. P. 1890 completely volatile; congeals at 0° C.)	L. Kebler.
Pepper, Black.	Adulterated with tapioca, colored with lampblack.	L. Kebler.
Podophyllin, U. S. P.	3 per cent., 5 per cent., 2.5 per cent., 5.5 per cent., 2.25 per cent. insoluble in alcohol (U. S. P. 1900—1 per cent.)	E. L. Patch.
Peppermint, Spirit.	Nine samples, three had 10 per cent. oil, one 1.5 per cent. oil, and 70.5 per cent. alcohol; one 0.5 oil and only traces of alcohol, one 75 per cent. alcohol and 0.5 oil; two 4 per cent. oil and wood alcohol. La. Assoc.	E. L. Patch.
Potassium Bromide.	Three samples, 2 excessive amount of sulphate.	L. D. Havenhill.
Potassium Bromide.	Twenty samples marked U. S. P. 96.5 per cent., 99.1 per cent., 97.27 per cent., 97.7 per cent., 96.3 per cent., 98.5 per cent., 98.58 per cent., 96.2 per cent., 99.18 per cent., 99.56 per cent., 99.27 per cent., 99.8 per cent., 99.13 per cent., 97.2 per cent., 98.09 per cent., 97.6 per cent., 98.15 per cent., 98.07 per cent., 99.41 per cent., 97.07 per cent.	E. Gane.
Potassium Bromide.	Twenty-five samples, three excess chloride, two sulphate, one sodium, five dirt, fourteen U. S. P.	Chas. E. Caspari.
Potassium Bromide.	One, 99.5 per cent.	T. Wetterstroem.
Potassium Citrate.	Off color, mechanical impurities, chloride and sulphate.	L. Kebler.
Potassium Cyanide Reagent.	94.6 per cent. cyanide, balance largely chloride.	L. Kebler.
Potassium Cyanide, C. P.	89.64 per cent.	L. Kebler.
Potassium Hydroxide, strictly C. P. (free from sulphur).	Contained sulphate and chloride.	L. Kebler.
Potassium Iodide.	Excess iodate, free iodine and iron.	E. L. Patch.
Potassium Iodide.	One sample, 99.8 per cent.	T. Wetterstroem.
Potassium Iodide.	Forty samples, 5 excess alkali, 5 sodium, 10 sulphate, nitrate and chloride, 12 small portions of iodate, 10 U. S. P.	Chas. E. Caspari.
Potassium Nitrite, C. P.	86.3 per cent. pure.	L. Kebler.
Quinine Sulphate.	Excess of other alkaloids.	E. L. Patch.
	2 gr. pills only 1.3 grains. Mass. State B. of H.	
Quinine Bisulphate.	Contained 1.7 per cent. potass. sulphate.	E. Gane.

Rochelle Salt.	Very dirty and contained iron salt and chloride.	L. Kebler.
Saffron.	Mixed with a soluble potassium salt. Gave 25 per cent. ash. C. & D.	E. Gane.
Saffron.	Contains 14 per cent. sugar naturally, more sometimes added. Am. D.	E. L. Patch.
Shellac.	Adulterated with resin 10 to 50 per cent. O. P. & D. Rep.	E. L. Patch.
Soap, Castile.	Six samples: One adulterated with animal fat, one with sodium silicate, four pure.	L. D. Havenhill.
Sodium Bicarbonate.	Of ten samples only four gave clear solutions with water. Four contained excessive amount of normal carbonate.	L. D. Havenhill.
Sodium Bromide.	Eighteen samples: Four chloride, one sulphate, one metallic impurities, three dirt, ten U. S. P.	C. E. Caspari.
Soda Crystals.	A mixture of carbonate and sulphate supplied. C. & D.	E. Gane.
Sodium Carbonate.	Contained 42 per cent. sulphate. Br. Food Journal.	L. Kebler.
Sodium Citrate.	Two samples insoluble in 20 parts water. One contained excess of lead.	E. L. Patch.
Sodium Phosphate.	Forty-one samples contained 0.1 millegrams As. in 100 G. Twenty-two samples contained 1 to 5 millegrams As. in 100 G. Nine samples contained 5 to 10 millegrams As. in 100 G. Six samples contained 10 to 15 millegrams As. in 100 G. Five samples contained 30 to 52 millegrams As. in 100 G.	L. Kebler.
Sodium Phosphate.	One sample contained $\frac{1}{32}$ grain acid arsenous in one ounce.	T. Wetterstroem.
Sodium Salicylate.	U. S. P. requirements too rigid. Fifteen lots contained chloride, 7 sulphate, 9 gave turbid solutions, 2 metallic impurities, 7 carbonizable material.	C. E. Caspari.
Sodium Salicylate.	Talcum, 15 per cent., substituted for sodium salicylate in tablets.	L. Kebler.
Sodium Salicylate.	Contained chloride and sulphate.	E. L. Patch.
Spirit Nitrous Ether.	Of 20 samples: One below 1 per cent., two below 2 per cent., eight below 3 per cent., eight below 4 per cent., one above 4 per cent.; average, 2.78 per cent. Alumni Journ. M. C. P.	E. L. Patch.
Spirit Nitrous Ether.	Three samples: One acid, two neutral; full alcoholic strength; ethyl nitrite 1.8 per cent., 3.64 per cent., 4.7 per cent. by volume.	T. Wetterstroem.

Spirit Nitrous Ether.	27.42 per cent. of a standard required. C. & D.	L. Kebler.
Sulphur, Precipitated.	Six samples: One gave 0.21 per cent. ash, remaining five 37 per cent. to 50 per cent. calcium sulphate.	L. D. Havenhill.
Sulphur, Precipitated.	One sample 52 per cent. calcium sulphate.	C. E. Caspari.
Sumac.	Large quantities mixed with pistacea lentiscus. Bureau Chem.	B. J. Howard.
Tablets.	Strychnine with no strychnine. Morphine with no morphine. Calomel with no calomel. Put out by various manufacturers. Pharm. Era.	E. L. Patch.
Terebene.	One lot very dark-colored. One lot 1½ per cent. dark residue. One lot contained petroleum benzine.	E. L. Patch.
Uranium Acetate, C. P.	Contained 16.05 per cent. sodium acetate.	L. Kebler.
Uranium Acetate, Highest Purity.	Contained 16 per cent. sodium acetate.	L. Kebler.
Wax, Yellow.	Of eleven samples only four met U. S. P. requirements for melting-point and sp. gr.	L. D. Havenhill.
Wax, White.	Two samples melted at 62° C. (U. S. P. about 65 per cent.)	L. D. Havenhill.
Wines.	Twelve contained arsenic, one arsenic and benzoic acid, two arsenic and coal-tar dyes, two salicylic acid and coal-tar dyes, five salicylic acid, five benzoic acid, eight coal-tar dye, one aluminum, benzoic acid and coal-tar dye. Bull. Health Dept. Cal.	L. Kebler.
Witch Hazel.	Fifteen samples all contained formaldehyde, one wood alcohol. Alcohol strength six between 9 and 10 per cent., four between 10 and 11 per cent., one between 11 and 12 per cent., three between 12 and 13 per cent. by volume.	Chas. H. LaWall.

The report was received with applause, and the Chair called for action on it. On motion of Mr. Wilbert, it was ordered received and referred to the Publication Committee.

The Chair called attention to the recommendation made in the report, whereupon Mr. Wilbert moved that the resolution submitted in connection with the report be adopted as the sense of this Section and referred to the Association in general session, and the motion was seconded by Mr. Main and carried.

The Chair called for reports from other committees, but none were tendered.

The Chair then announced that the nomination of officers for the ensuing year was the next order of business.

Mr. Wilbert nominated Mr. Charles E. Caspari, of St. Louis, for Chairman. Mr. Caspari expressed his appreciation of the mention of his name in this connection, but felt impelled for two reasons to decline it, principally because he was not sure he could attend the meeting next year. His other reason was, that he had been a member of the Association such a short time that he thought somebody else longer in the service should be selected.

Mr. Eccles then put Mr. H. H. Rusby in nomination for Chairman, but Mr. Rusby said it had been but a short time since he was Chairman of a Section and the honors should go round, and therefore he must decline. Mr. Rusby then in turn nominated Mr. Geo. C. Dieckman, of New York, but Mr. Dieckman also declined on the score that he could not give the duties of the office the proper attention.

Mr. Puckner said he desired to renew the nomination of Mr. Caspari, of St. Louis. He had proven his usefulness as Secretary, and a good Secretary one year ought to make a good Chairman the next; he hoped, therefore, Mr. Caspari would accept the nomination.

Nominations for Secretary were then called for, and Mr. Hynson, seconded by Mr. Wilbert, nominated Mr. Daniel Base, of Baltimore.

Mr. Hynson said that in looking over the excellent program put before the Section he had noticed two papers that he thought should go to the Section of Practical Pharmacy and Dispensing—one by Mr. J. P. Remington, Jr., on an improved form of retort-stand for druggists' use, and one by Mr. Henry Kraemer, on a bottle for keeping sterilized pharmaceutical preparations, and he moved that they be so referred. The Chair explained that Mr. Remington had specially requested that his paper might be presented before this Section, because he would have to leave before the close of the meeting and could not attend the sessions of the Section of Practical Pharmacy and Dispensing. Mr. Remington was present, and explained that his brother was to be married Saturday, in a distant part of the country, and he would be compelled to leave to-morrow morning in order to get to the wedding in time. Of course, Mr. Hynson yielded the point upon this explanation, and Mr. Remington presented his subject later in the session. The motion to refer the paper of Mr. Kremers failed for want of a second.

Mr. Chas. Caspari, Jr., read in abstract a paper contributed by Dr. Frederick B. Power, of London, and his assistant, Mr. Tutin, on the subject of grindelia, and remarked that the work done by these gentlemen was probably conclusive on this subject.

CHEMICAL EXAMINATION OF GRINDELIA.

BY FREDERICK B. POWER, PH. D.,
Director of the Wellcome Chemical Research Laboratories, London,
and
FRANK TUTIN.

Under the title of *Grindelia* the Pharmacopœia of the United States recognizes "the dried leaves and flowering tops of *Grindelia robusta*, Nuttall, or of *Grindelia squarrosa* (Pursh) Dunal." It is also officially recognized under the same designation in the Indian and Colonial Addendum to the British Pharmacopœia.

A description of *Grindelia robusta*, with information concerning its therapeutic uses and the recommendation of suitable pharmaceutical preparations, was given by James G. Steele in a paper communicated to the American Pharmaceutical Association in 1875.*

Although the drug has been used medicinally for a number of years, the chemical examinations which have hitherto been made of it are somewhat incomplete. Moreover, a number of statements respecting substances which have been supposed to be contained in the drug are either of a contradictory nature or, not being accompanied by any analytical data, are exceedingly indefinite and of doubtful accuracy.† For these reasons it does not seem expedient to enter in detail upon a critical review of the existing literature, although consideration may be given to some of the recorded observations pertaining to special substances. Clark, for example (*loc. cit.*), was unable to confirm a statement by Rademaker respecting the occurrence of an alkaloid in the drug, but inferred that it contained "saponin or an allied body," for which the name of *grindelin* was suggested. He, furthermore, considered it probable that the medicinal properties of the Grindelias are due to this substance, and advanced the theory that "the resin found in the drug is wholly a decomposition product of grindelin." Fischer (*loc. cit.*) has indicated that the most important constituents found by him were a crystallizable acid, soluble in water, alcohol, and ether, which he termed "robustic acid," and an alkaloid which was designated as "grindeline," but neither of these substances appear to have been sufficiently characterized. Schneegans (*loc. cit.*) stated that he obtained two glucosides having the characters of saponin, one of which was precipitated by the normal acetate and the other by the basic acetate of lead. On the other hand, the evidence for an alkaloid was so slight as to lead him to doubt the presence of such a substance.

It is apparent from this brief survey that our knowledge of the constituents of *Grindelia* could not be regarded as satisfactory, and it was, there-

* Proc. A. Ph. A., 1875, *23*, p. 637. Compare also *Ibid.*, 1879, *27*, p. 609.

† Clark, Amer. Journ. Pharm., 1880, *60*, p. 433; Schneegans, *Ibid.*, 1892, *64*, p. 369; Fischer, Proc. A. Ph. A., 1888, *36*, p. 342; Libby, *Ibid.*, p. 343.

fore, with the hope of somewhat further elucidating the subject that the present investigation was undertaken.

EXPERIMENTAL.

The material employed for this investigation consisted of an original bale of the drug procured directly from California. Having been obtained from this region, it was evidently *Grindelia robusta*, one of the varieties of the latter, or a closely related species. The material in question was, in fact, found to conform most closely in its characters to the description of *Grindelia camporum*, Greene. There is, however, according to Jepson,* a complete chain from *G. robusta*, Nuttall, var. *Davyi* to *G. camporum*, in which every gradation occurs. The same botanist remarks that "*G. robusta* and its varieties in their extreme forms are more unlike each other than are the species *G. camporum* and *G. rubricaulis*, thus affording an exceilent illustration of the principle that, in a highly variable group, varieties of a species may be more unlike than a species is unlike another species."

The drug was of good quality, and in every respect met the requirements of the United States Pharmacopœia.

In order to ascertain the general character of the constituents of the drug, 50 Gm. of it, in moderately fine powder, were extracted successively in a Soxhlet apparatus with the following liquids. After removing the solvents, the residual extracts were dried at 100° C. until of constant weight.

Petroleum (b. p. 40–50° C.)	yielded	3.63 Gm.	= 7.26	per cent.
Ether	"	2.56 "	= 5.12	"
Chloroform	"	0.66 "	= 1.32	"
Alcohol	"	3.95 "	= 7.90	"
Water	"	5.35 "	= 10.70	"
		Total	= 32.30	"

The petroleum extract was a light yellowish-brown, viscid substance, which, when heated in the water-oven, formed a thick, oily liquid. The ether and chloroform extracts were dark greenish-brown resins. These three extracts were treated with acidulated water and tested for an alkaloid, but with a negative result. The alcoholic extract was a dark-brown, sticky mass. When treated with acidulated water, the filtered liquid gave a very slight reaction with alkaloid reagents and frothed somewhat on shaking, but both of these characters were apparently due to proteid substances. The liquid also reduced Fehling's solution, gave a black coloration with ferric chloride, and a very voluminous precipitate with basic lead acetate. The final aqueous extract was of a dark-brown color, and consisted chiefly of gummy substances.

* Jepson, "Flora of Western Middle California," p. 554.

For the more complete examination of the constituents of the drug, 207 pounds of it were finely ground and extracted in a suitable apparatus with hot alcohol. After the removal of the greater portion of the solvent, a soft, dark-brown extract was obtained which weighed 70½ pounds, thus representing 34 per cent. of the weight of the drug. 100 Gm. of this extract, after heating in a water-oven, weighed 87 Gm. The yield of dry extract from the drug was therefore 29.6 per cent. A portion of this was successively extracted in a Soxhlet apparatus with light petroleum, ether and alcohol.

Petroleum (b. p. 40–50° C.) extracted.	46.4 per cent.
Ether	38.0 "
Alcohol.	15.6 "
	100.0 per cent.

The petroleum extract was a soft, sticky solid, having a bright green color and the characteristic odor of the drug. It was heavier than water, and did not consist of fatty oil, but, as will be shown later, was of a resinous nature. The ether extract was a dark-green, rather soft resin. The alcoholic extract formed a dark-brown, sticky mass.

Constituents of the Alcoholic Extract of the Drug.

1000 Gm. of the original alcoholic extract were brought into a flask with water, and steam passed through the mixture until oily drops were no longer visible in the condenser. The contents of the flask, when cold, consisted of a dark-brown aqueous liquid (*A*) and a solid cake of resin (*B*). The latter was separated, extracted with a further quantity of hot water to remove any soluble matter, and these washings added to the decanted aqueous liquid.

Examination of the Steam Distillate.

The aqueous distillate had an acid reaction, and contained a small quantity of a *volatile oil* floating on the surface. It was shaken out with pure ether, the ethereal liquid dried with anhydrous sodium sulphate, and the ether removed, when two grams of a bright yellow oil were obtained, corresponding to 0.068 per cent. of the original drug.* The volatile oil possessed in a high degree the characteristic odor of the drug, but the amount was too small for its further examination. The acids contained in the aqueous liquid from which the oil had been removed were converted into their barium salts. The latter rapidly reduced silver nitrate and mercuric chloride, and when warmed with a little ethyl alcohol and sulphuric acid developed the odor of a butyric ester. The volatile acids, therefore, consisted chiefly of *formic acid*, with apparently a little *butyric acid*.

* Compare Haensel, Pharm. Zeitung, 1903, No. 57, p. 574, and *Proc. A. Ph. A.* 1904, 52, p. 865.

Examination of the Aqueous Liquid (A).

The aqueous liquid from which the resinous substances had been removed, as described in the preceding operation, and which, therefore, contained those constituents of the original alcoholic extract which are soluble in water, had a very dark brown color. It afforded no reaction for an alkaloid, but was abundantly precipitated by both neutral and basic lead acetates. It was, therefore, first completely precipitated by neutral lead acetate, the yellowish-brown precipitate collected, and washed with a little water. To the filtrate from this precipitate a solution of basic lead acetate was added until no further precipitate was produced. This precipitate, which was much more voluminous than the preceding one and had a bright lemon-yellow color, was also collected, and washed with a little water. The filtrate from the latter precipitate was finally deprived of lead by means of hydrogen sulphide, and filtered.

Precipitate produced by Neutral Lead Acetate.—This was suspended in water and treated with hydrogen sulphide until the lead had become completely converted into sulphide, the liquid then heated to the boiling-point, and filtered. On cooling, a quantity of tarry matter separated, which was removed by filtration, and the liquid was then concentrated under diminished pressure, when a further quantity of a dark reddish-brown tarry substance was deposited. The filtrate from the latter, when further concentrated, formed a thick, dark-brown syrup, from which nothing crystalline could be obtained.

Precipitate produced by Basic Lead Acetate.—This was treated in precisely the same manner as the preceding precipitate, and yielded ultimately only a small amount of tarry and resinous substances.

Neither of the liquids obtained from the above-mentioned lead precipitates produced any characteristic froth when vigorously shaken, and there was, therefore, no evidence of the presence in Grindelia of substances belonging to the class of saponins, as had been assumed by Clark and by Schneegans (*loc. cit.*).

Filtrate from the Precipitate produced by Basic Lead Acetate.—This liquid, as previously stated, was deprived of lead by means of hydrogen sulphide, and filtered. It was then of a light brownish-yellow color, and, when concentrated under diminished pressure, formed a thick, brownish syrup. It gave no reaction for alkaloids, but when warmed with a solution of potassium hydroxide evolved an abundance of ammonia, thus indicating the presence of *proteid substances* or their degradation products. A portion of the liquid was decolorized by means of animal charcoal, and then allowed to remain for some time in a vacuum over sulphuric acid, but no crystalline substance separated. The syrupy liquid was lævorotatory, and readily afforded a crystalline osazone, which melted at 205–206° C. The sugar present in the liquid was, therefore, apparently *l-glucose*.

Examination of the Resins (B).

The mixture of resinous substances obtained by the treatment of 1000 Gm. of the original alcoholic extract of the drug with water, as previously described, was dried in a water-oven, and then weighed 637 Gm. For the further examination of this product it was mixed with purified sawdust, the mixture dried as completely as possible, and then extracted successively in a Soxhlet apparatus with light petroleum, ether and alcohol. After the removal of the respective solvents, the residual extracts were dried in a water-oven.

Petroleum (b. p. 40–50° C.) extracted	40.2	per cent.
Ether "	49.8	"
Alcohol "	8.2	"
Loss	1.8	"
	100.0	

I. Petroleum Extract of the Resins.

This extract consisted of a soft, sticky solid, having a dark greenish color. 228 Gm. of it were mixed with an alcoholic solution of 60 Gm. of potassium hydroxide, this amount of alkali being about 1½ times that required to hydrolyze an equal weight of tri-stearin. On heating, the liquid rapidly became black and a very large amount of ammonia was evolved. After boiling the mixture for half an hour the evolution of ammonia ceased, but as the addition of another 10 Gm. of caustic potash caused the further development of ammonia, 30 Gm. more of alkali were added in order to ensure complete hydrolysis, and the boiling was then continued for 1½ hours. The alcohol having been removed by distillation, the residual alkaline mixture was diluted with water, and shaken out with six successive portions of ether. The ethereal liquid was washed with water, dried with calcium chloride, and the ether removed, when an orange-colored crystalline residue was obtained. This was purified by dissolving it in warm alcohol and treatment with animal charcoal, when, on cooling, about 5 Gm. of a crystalline substance separated. After recrystallization from ethyl acetate, it was obtained in the form of glistening, pearly plates, melting at 68° C. It was analyzed with the following result:

0.1344 gave 0.4176 CO_2 and 0.1760 H_2O. C = 84.7; H = 14.5.

$C_{31}H_{64}$ requires C = 85.3 : H = 14.7 per cent.

The substance was thus identified as *hentriacontane*, a hydrocarbon which has recently been found by us in Gymnema leaves,* and has also been isolated from Kô-sam seeds † and from the leaf of tobacco.‡

The alcoholic mother-liquors from the hentriacontane, when concen-

* Year-Book of Pharmacy, 1904, p. 531.

† Power and Lees, *Ibid.*, 1903, p. 512.

‡ Thorpe, Journ. Chem. Soc., 1901, *79*, p. 985.

trated and allowed to stand for some time, afforded a small amount of another substance in the form of glistening plates. These were separated from the syrupy liquid and recrystallized from alcohol, when, after drying at 100° C., they melted at 164° C. The air-dried substance was analyzed:

0.0621 gave 0.1821 CO_2 and 0.0651 H_2O. C=80.0; H=11.6.

$C_{26}H_{44}O$, H_2O requires C=80.0; H=11.8 per cent.

$C_{24}H_{40}O$, H_2O requires C=79.6; H=11.6 per cent.

In order to obtain a further quantity of this substance, 3000 grams of the original alcoholic extract were boiled with an excess of an alcoholic solution of potassium hydroxide, the liquid then diluted with water, and shaken out several times with ether. The ethereal liquid afforded a residue which was fractionally crystallized from alcohol in order to remove the hentriacontane, and the substance obtained from the mother-liquors, after being recrystallized several times from a mixture of ethyl acetate and alcohol, was finally crystallized from alcohol. It then melted at 166° C., and this melting-point was not altered by further crystallization.

0.1097 on drying at 110° C. lost 0.0051 H_2O. H_2O=4.6.

$C_{26}H_{44}O$, H_2O requires H_2O=4.6 per cent.

$C_{24}H_{40}O$, H_2O requires H_2O=5.0 per cent.

0.1046 of anhydrous substance gave 0.3185 CO_2 and 0.1092 H_2O.

C=83.0; H=11.6 per cent.

$C_{26}H_{44}O$ requires C=83.9; H=11.8 per cent.

$C_{24}H_{40}O$ requires C=83.7; H=11.6 per cent.

When a small quantity of this substance was dissolved in chloroform, a little acetic anhydride added, and then a drop of concentrated sulphuric acid, a rose color was at once produced which rapidly changed to violet, then to an intense blue, and, on long standing, became dark-green and finally brown. It is evident from these characters that the substance is either an isomeride of phytosterol or a lower homologue.

The strongly alkaline solution of the petroleum extract from which the hentriacontane and phytosterol had been obtained was acidified with sulphuric acid, when a considerable quantity of dark-brown, tarry matter separated. It was then distilled in steam, when an acid distillate was obtained which contained a small amount of oily substance. The distillate was therefore extracted with ether, and from the acid removed by the latter a barium salt was prepared, which was subsequently converted into a silver salt. This was dried in a vacuum over sulphuric acid and analyzed.

0.2337 gave on ignition 0.1162 Ag. Ag = 49.7 per cent.

As silver valerate and silver caproate require respectively 51.7 and 48.4 per cent. of silver, the oily acid was apparently a mixture. In the distillate, after extraction with ether, *formic acid* was identified.

The liquid remaining in the distillation flask was extracted with ether, which removed a quantity of a dark-brown, tarry substance of disagreeable odor. This was soluble in all the ordinary organic solvents, and noth-

ing crystalline could be obtained from it. 20 Gm. of this tarry substance were fused with 100 Gm. of potassium hydroxide. The temperature of the melted mass, which was at first about 130° C., was gradually increased to 280° C., and maintained at that point for some time, but a portion of the substance still remained undissolved and formed an oily layer on the surface. After being allowed to cool, the mass was dissolved in hot water and the liquid acidified with sulphuric acid, when a quantity of a black resin separated. The mixture was then distilled in steam, and yielded an acid distillate which contained a few oily drops having an odor of valeric acid. It was extracted with ether, but the amount of acid removed by the latter was too small for analysis. The acids remaining in the distillate were converted into barium salts, and from the concentrated solution of the latter a crystalline salt separated, which was dried at 110° C., and analyzed.

0.3026 of the salt gave 0.2768 $BaSO_4$. Ba = 53.8 per cent.

Ba $(C_2H_3O_2)_2$ requires Ba = 53.8 per cent.

The mother-liquors from this salt contained an abundance of barium formate.

The volatile acids formed by the fusion of the above-mentioned tarry substance with alkali therefore consisted chiefly of *acetic* and *formic acids*.

The liquid remaining in the distillation flask, after the removal of the resin, was extracted with ether, but this afforded only a very small amount of an oily substance of indefinite character.

The results of our examination of the portion of Grindelia resin which is soluble in light petroleum, do not enable us to confirm the observation of Clark * respecting the presence of a fatty oil. The latter investigator although apparently having used but 100 Gm. of the crude drug for extraction with petroleum, states that he obtained "a fixed oil which was solid at ordinary temperatures, melting at 37° C." It was furthermore stated that, after saponification of the oil, "non-volatile fatty acids were obtained, which were separated by fractional precipitation with magnesium acetate, and found to consist of palmitic, stearic, and oleic acids. He has, however, recorded no analyses, nor given any other evidence of the identity of these substances.

II. Ether Extract of the Resins.

This was a very dark-colored solid, and, as it appeared to contain no crystalline substance, it was thought of some interest to ascertain the character of the products afforded by its fusion with caustic alkali. 48 Gm. of the resin were therefore added to 250 Gm. of potassium hydroxide, previously dissolved in a little water and heated to about 100° C. The heating was then continued until a temperature of 250° C. was gradually attained, when the resin formed a slimy black mass on the surface of the

* Amer. Journ. Pharm., 1888, *60*, p. 435.

fused alkali. After being allowed to cool, the mass was boiled with water, when it entirely dissolved, forming a dark reddish-brown liquid. This was acidified with sulphuric acid, which caused the separation of a considerable quantity of black resin, and then distilled in steam. The acid distillate, which contained some oily drops having the odor of valeric acid, was extracted with ether. After the removal of the ether, the acid was converted into a barium salt, from which, by fractional precipitation with silver nitrate, three silver salts were subsequently obtained.

First Fraction.—This became decomposed, owing to the presence of a little formic acid.

Second Fraction.—This was washed with water, dried on a tile, and finally in a vacuum.

0.0724 gave on ignition 0.0348 Ag. Ag = 48.1 per cent.

Ag $C_6H_{11}O_2$ requires Ag = 48.4 per cent.

Third Fraction.—This was much more readily soluble in water than the preceding fraction.

0.1812 gave on ignition 0.1096 Ag. Ag = 60.4 per cent.

Ag $C_3H_5O_2$ requires Ag = 59.7 per cent.

Ag $C_2H_3O_2$ requires Ag = 64.7 per cent.

The acids remaining in the distillate after extraction with ether were converted into barium salts. The solution of the latter was found to contain a considerable amount of formate, and when concentrated a crystalline salt separated. This was recrystallized from water, dried at 110° C., and analyzed.

0.3334 gave 0.3049 $BaSO_4$. Ba = 53.8 per cent.

Ba $(C_2H_3O_2)_2$ requires Ba = 53.8 per cent.

The volatile acids formed by the fusion of the ether-soluble resin with caustic alkali were therefore chiefly *formic* and *acetic*, with small amounts of some higher acids of the same series.

The liquid remaining in the distillation flask was allowed to cool, decanted from a large amount of resinous matter, and repeatedly extracted with ether. The ethereal liquid yielded a residue which, after solution in water and treatment with animal charcoal, separated in a crystalline form. It was further purified by recrystallization from water, when 0.46 Gm. of a colorless substance was obtained, which melted at 194° C. and gave the color-reactions characteristic of protocatechuic acid. The substance was dried at 110° C. and analyzed.

0.1411 gave 0.2973 CO_2 and 0.0536 H_2O. C = 57.4; H = 4.2.

$C_7H_6O_4 + C_7H_6O_3$ requires C = 57.5; H = 4.1 per cent.

This substance evidently represents the *molecular compound of protocatechuic and para-oxybenzoic acids*, which is produced by the fusion of certain resins with caustic alkali, and was recently obtained by us by this means from the so-called gymnemic acid of gymnema leaves.*

* Year-Book of Pharmacy, 1904, p. 537, and Beilstein's Handbuch der organischen Chemie, Bd II, p. 1740.

III. Alcohol Extract of the Resins.

This was a firm, black, amorphous solid. As previously indicated, it represented but a relatively small proportion of the total resin, and, as it apparently contained no crystalline substance, it was subjected to no further treatment.

SUMMARY.

The result of this investigation may be briefly summarized as follows:

The chief constituents of *Grindelia* are amorphous resins, to which its medicinal value is probably to be attributed.

The total amount of resinous substances contained in the official drug, as determined by extracting it with hot alcohol and treating this extract with water, was found to be 21.6 per cent. These resins represent a complex mixture, which, by successive extraction with light petroleum, ether, and alcohol, was resolved into the following products:

I. *Petroleum Extract of the Resins.*—This was a soft, sticky solid, of a greenish color. It was of a resinous nature, and did not consist of fatty oil, which a previous investigator stated to have obtained from the drug by extraction with petroleum. When heated with an alcoholic solution of potassium hydroxide, it evolved a large amount of ammonia. From this alkaline liquid ether extracted a crystalline hydrocarbon, *hentriacontane*, $C_{31}H_{64}$, and another crystalline substance, melting at 166° C., which is either an isomeride of *phytosterol*, $C_{26}H_{44}O$, or a lower homologue. On subsequently acidifying the alkaline liquid with sulphuric acid, a quantity of dark-brown, tarry matter separated, and this mixture, when distilled, yielded *formic acid*, with a very small amount of a mixture of higher fatty acids. The liquid containing the tarry matter was extracted with ether, which removed a quantity of a dark-colored, amorphous product. This when fused with caustic potash yielded chiefly *formic* and *acetic acids*.

II. *Ether Extract of the Resins.*—This was a dark-colored resin, from which no crystalline substance could be separated. When fused with caustic potash, it yielded *formic*, *acetic*, and *some higher acids* of the same series, together with a crystalline substance, melting at 194° C., corresponding to the *molecular compound of protocatechuic and para-oxybenzoic acids*.

III. *Alcohol Extract of the Resins.*—This was a very dark-colored, amorphous substance. It represented but a relatively small proportion of the total resin, and did not admit of further examination.

In addition to the above-mentioned resinous substances, *Grindelia* contains a considerable amount of a lævo-rotatory sugar, which afforded an osazone melting at 205–206° C., and is apparently *l-glucose*. It also contains *proteid substances*, amorphous *coloring matter* and *tannin*, and an exceedingly small amount of an *essential oil*, possessing the characteristic odor of the drug.

We are unable to confirm the observations of previous investigators respecting the presence of a saponin or an alkaloid.

The paper was applauded, and Mr. Wilbert moved to receive and refer to the Publication Committee.

Mr. Eccles remarked that the paper did not show whether it was Grindelia *robusta* or *squarrosa* that the author used personally, nor did he state the age of it. Mr. Caspari read from the paper to show that the material employed for the investigation consisted of an original bale of the drug procured direct from California, and evidently Grindelia robusta or one of its varieties, or a closely-related species, although the age was not stated.

Mr. Rusby stated that the paper was not entirely satisfactory, in the failure to state the exact species of grindelia used, and that in California one would meet Grindelia robusta or Grindelia squarrosa, and more likely the latter.

The motion to receive and refer the paper was then put and carried.

At request of the Chair, Mr. Edward Kremers presented in abstract a paper on Scopoline, by Prof. Ernst Schmidt, of Marburg, and gave some blackboard illustrations of the subject. The text of the paper here follows:

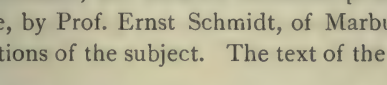
[Contributions from the Pharmaceutical-Chemical Institute of the University of Marburg.]

CONCERNING SCOPOLINE.

BY ERNST SCHMIDT.

(Translated from the original German by Richard Fischer, Madison, Wis.)

In 1902 I reported in the Proceedings of the A. Ph. A. that by the action of hydrobromic acid upon scopoline a second hydroxyl group was formed, in consequence of which this base, which is formed by the hydrolytic decomposition of scopolamine, was changed into a dihydroxyl compound. This change can only be understood upon the assumption that the second oxygen atom of scopoline exists in an ether- or morpholine-like combination, so that under the above conditions the group



I now wish to report on some experiments made to further solve the constitution of scopoline, and more particularly to determine the place at which the morpholine-like oxygen atom is attached to the molecule of this base.

In the first place I attempted to split off the two hydroxyl groups, in the form of water, from hydrobromscopoline hydrobromide, ($C_8H_{14}BrNO_2$. HBr), the addition product of scopoline and hydrobromic acid. A similar attempt had already been made by W. Luboldt upon scopoline itself, using glacial acetic acid and sulphuric acid, but with negative results. In my experiments I heated hydrobromscopoline hydrobromide with the tenfold quantity of 5 per cent. hydrochloric acid for six hours at 190° C. but without

achieving the desired results. From the products of the reaction only scopoline could be isolated, showing that under these conditions hydrobromic acid must have been split off with reformation of this base. The scopoline was identified by means of its gold double salt.

Under similar experimental conditions, hydroscopoline hydrobromide ($C_8H_{15}NO_2.HBr$), the reduction product of hydrobromscopoline hydrobromide, also failed to yield the desired compound.

HYDROSCOPOLIDINE ($C_8H_{15}N$).

Another method which furnished the possibility of obtaining an oxygen-free base from scopoline, appeared to be the substitution of bromine for the two hydroxyl groups of hydrobromscopoline, and the reduction of the resulting tribrom compound with hydrogen. To this end I boiled hydrobromscopoline hydrobromide with phosphorus tribromide under a reflux condenser until the evolution of hydrobromic acid ceased, freed the resulting substance from phosphorus bromide as much as possible by evaporation upon the water-bath, and finally reduced it with zinc and dilute sulphuric acid. The evaporated mass was then repeatedly extracted with alcohol distilled from the extract, and the syrupy residue (R), after addition of an excess of sodium hydroxide, subjected to steam distillation. The resulting distillate, of a strongly alkaline reaction and possessing a mild narcotic odor, was used for the preparation of a gold double salt, which appeared in the form of small, stellately grouped, translucent yellow needles, difficulty soluble in cold water. M. P. 202–206° C.

0.1572 Gm. contained 0.0664 Gm. Au.

Found:	*Calc. for* $C_8H_{15}N.HCl + AuCl_3$*:*
Au. 42.23 per cent.	42.30 per cent.

The same gold salt could also be obtained directly from the above syrupy residue (R), after removal of the hydrobromic acid with freshly precipitated chloride of silver.

0.218 Gm. contained 0.092 Gm. Au. = 42.22 per cent.

This gold double salt resembled hydrotropidine-gold chloride in appearance, but their identity is impossible since the latter, which I prepared for purposes of comparison, melts at 242–244° C., while the melting-point of the former was found to be ———. However, this hydroscopolidine-gold chloride seems to be identical with the gold salt of the base obtained by the action of hydriodic acid upon scopoline.*

CHANGE OF SCOPOLINE INTO PYRIDINE.

If scopoline is changed into scopoligenine, †

$C_7H_{10}O_2.NCH_3$	$C_7H_{10}O_2.NH$
Scopoline	Scopoligenine (Norscopoline),

* Proc. A. Ph. A., (1902) 50, p. 284.

† Archiv. d. Pharm., 1898, p. 23.

by careful oxydation with barium permanganate in alkaline solution, and the latter base, mixed with 15–20 times its weight of zinc dust, subjected to dry distillation in an atmosphere of hydrogen, the same decomposition products appear to be formed as in the case of tropigenine (nortropine). Besides combustible, bromine-reducing hydrocarbons, a strongly alkaline liquid possessing the odor of pyridine resulted, upon the surface of which small quantities of tar-like products were floating. Upon dissolving the distillate in dilute hydrochloric acid, adding an excess of sodium carbonate and distilling, a colorless distillate was obtained which yielded a gold double salt crystallizing in long needles and refusing to melt at 250° C. Its behaviour and composition proved it to be pyridine-gold chloride. 0.2452 Gm. contained 0.1154 Gm. Au. and yielded 0.3325 Gm. AgCl.

Found:	*Calc. for* $C_5H_5N.HCl + AuCl_3$*:*
Au. 47.06 per cent.	47.01 per cent.
Cl. 33.52 per cent.	33.89 per cent.

BEHAVIOR OF SCOPOLINE TOWARD BROMINE.

Upon treating a solution of scopoline in chloroform with one of bromine in the same solvent, the bromine completely disappears, unaccompanied however by any visible evolution of hydrobromic acid. Upon adding an excess of bromine, an oily liquid separates out in considerable quantities. After evaporation of the chloroform, this liquid upon standing over quicklime gradually solidifies into a crystalline mass, readily soluble in water. Upon recrystallizing, colorless crystals of *scopoline hydrobromide* were obtained.

Found:	*Calc. for* $C_8H_{13}NO_2.HBr$*,*
Br. 34.10 per cent.	33.90 per cent.

When finely pulverized scopoline was subjected under a glass bell-jar to the action of bromine vapor, the latter almost completely disappeared after a few days, while the scopoline is changed into a thick liquid of a deep reddish-brown color. Upon exposure to the air this liquid gives off bromine and is finally changed into a solid mass which dissolves in water with the separation of brown oily drops of a perbromide. After adding alcohol and warming upon a water-bath a yellow liquid resulted, upon evaporation of which colorless lamellar crystals separated out. These crystals turned brown and softened at 225° C., melting with complete decomposition at 230°. Scopoline hydrobromide does not melt at this temperature. 0.330 Gm. of the crystals lost 0.0037 Gm. at 100°; *i. e.*, 1.10 per cent. of their weight. The dried substance yielded 0.2699 Gm. AgBr.

Found:	*Calc. for* $C_8H_{13}NO_2.HBr$*:*	*For* $C_7H_{11}NO_2.HBr$*:*
Br. 35.20 per cent.	33.90 per cent.	36.03 per cent.

The mother liquors from this hydrobromide yielded crystallizations which

did not differ in their behavior from the first. Since apparently these hydrobromides did not consist of any homogeneous product, they were changed into hydrochlorides by digestion with silver chloride and then into gold double salts.

The first crystallization consisted of small thread-like crystals grouped in the form of a beard, and melting at 222–223° C. Their form, m. p. and gold content showed them to be scopoline-gold chloride. 0.2396 Gm. of the dried salt yielded 0.0952 Gm. Au.

Found:	*Calc. for* $C_8H_{13}NO_2.HCl + AuCl_3$*:*
Au. 39.73 per cent.	39.75 per cent.

The second crystallization, which resulted upon the further addition of gold chloride and gradual cooling, consisted of a mixture of small feather-like crystals and compact transparent needles. These forms could be separated mechanically, or a separation accomplished by gradual warming with the mother liquor, whereby the feather-like crystals redissolved, while the more compact needles remained behind. After recrystallization these needle-like crystals melted at 232–233° C.

0.240 Gm. contained 0.0979 Gm. Au.

Found:	*Calc. for* $C_7H_{11}NO_2.HCl + AuCl_3$*:*
Au. 40.59 per cent.	40.90 per cent.

Judging by their form, m. p. and gold content, these crystals consisted of scopoligenine-gold chloride.

The other mother liquor also furnished only mixtures of scopoline and scopoligenine-gold chlorides. *Found:* Au. 40.14 per cent., 39.98 per cent. According to these data the action of bromine under the above conditions results in the main only in the formation of scopoline hydrobromide and scopoligenine hydrobromide. In this respect also has scopoline shown itself considerably more stable than tropine and the closely-related tropinone, which latter, according to Willstaetter,* is changed under the above conditions into tetrabromtropinone, $C_8H_9Br_4O$.

BEHAVIOR OF SCOPOLINE TOWARD HYDROGEN PEROXIDE.

The behavior of scopoline toward hydrogen peroxide was studied some time ago by Francke in the laboratory of Gehe & Co., Dresden, but I do not have at hand the results of these investigations. To acquaint myself by my own studies with the behavior in this respect of scopoline as compared with tropine, the following experiments were carried out:

2 Gm. of scopoline were dissolved in a small quantity of water, 20 Gm. of hydrogen peroxide added in a 30 per cent. solution, and the mixture allowed to stand for several days at ordinary temperature. After the evolution of oxygen, which soon commenced, had ceased, I evaporated the

* Habilitationsschrift, 1896.

mixture at a moderate heat to a small volume and then set it aside to crystallize. Compact, colorless, in part tabular crystals gradually separated out, which melted at 122° C. with a strong evolution of gas. These crystals were readily soluble in water, forming a neutral solution; ether dissolved them less readily. The aqueous solution caused the liberation of iodine from a solution of potassium iodide. Still greater quantities of iodine were formed after acidulating with hydrochloric acid. Sulphurous acid was immediately oxidized to sulphuric acid, with the reformation of scopoline.

Upon adding gold chloride to a solution of this oxidation compound in dilute hydrochloric acid a voluminous yellow precipitate separated out, which, however, soon changed into the crystalline scopoline-gold chloride with the evolution of oxygen. When this voluminous precipitate was warmed with the mother liquor it readily dissolved with the copious evolution of oxygen and the separation of a small amount of metallic gold. Upon cooling, this solution yielded characteristic crystals of scopoline-gold chloride.

Hydrochloride. The hydrochloride of this scopoline oxidation product could be obtained by spontaneous evaporation of its aqueous solution in the form of long, acicular individual crystals, or as small needles in feather-like groups. These crystals turned red at 120° C.; at 132–135° C. they melted with copious evolution of gas. No loss of weight was sustained at 100° C.

0.1542 Gm. yielded 0.1044 Gm. AgCl.

Found:	*Calc. for* $C_8H_{13}NO_3.HCl$*:*
HCl. 17.22 per cent.	17.59 per cent.

The above data show that by the action of hydrogen peroxide, scopoline is converted into an unstable oxide, as is also the case with tropine and other bases that have an alkyl group attached to the nitrogen. As indicated by the investigations of Wernicke and Wolffenstein * concerning the action of hydrogen peroxide upon N-alkyl piperidine bases, the above conversion of scopoline into oxyscopoline is probably brought about by the mere change of the group

$$>N.CH_3 \text{ into } >N\overset{=O}{\underset{CH_3}{\diagdown}}$$

BEHAVIOR OF SCOPOLINE TOWARD CHROMIC ACID.

By oxidizing tropine with chromic acid, G. Merling † readily obtained the dibasic tropic acid. On account of the close relation which seems to exist between tropine and scopoline, it appeared of interest to study this reaction with the latter base. As a preliminary experiment 5 Gm. scopoline were dissolved in 20 Gm. water, this solution treated with a mixture of 12 Gm. chromic acid, 200 Gm. water and 20 Gm. sulphuric acid, and the liquid

* Ber. d. d. chem. Ges., 31, 1553. † Annal. d. Chem. 216, *p.* 348.

so obtained boiled for two hours under a reflux condenser, according to Merling's directions. The change in color of this mixture took place much more slowly than in the case of tropine, which for the sake of comparison was subjected to the same conditions. At the end of two hours a considerable amount of chromic acid remained unchanged, although an evolution of carbon dioxide was already apparent. It could further be shown by an examination of a small portion of the oxidation product, that the same still contained unchanged scopoline. A gold double salt prepared therefrom showed all the properties of scopoline-gold chloride. The rest of the oxidation product was therefore boiled for another hour and the chromic acid which then still remained unchanged finally reduced with sulphurous acid.

While tropic acid could readily be obtained from the oxidation product of tropine by following the directions of Merling, it was found impossible to isolate either tropic acid or any related compound from the scopoline oxidation product by employing the same method. I therefore freed this oxidation product from chromium and sulphuric acid by the addition of baryta water, and then changed it into a gold double salt. Upon slow evaporation of the respective solutions and repeated recrystallization of the separated double salts, I finally succeeded in obtaining considerable quantities of two distinct compounds, of which the one (I) had the properties and composition of the gold salt of the unchanged scopoline, while the other (II) corresponded with the gold salt of scopoligenine (norscopoline).

Gold Double Salt I consisted of small feather-like crystals, which upon remaining in their mother-liquor changed in a characteristic manner into compact, transparent, yellowish-red crystals. M. p. 220–223° C.

0.240 Gm. of the dried salt yielded 0.095 Gm. Au.

Found:	*Calc. for* $C_8H_{13}NO_3.HCl+AuCl_3$*:*
Au. 39.58 per cent.	39.75 per cent.

Gold Double Salt II appeared in bundles of prismatic crystals, or as fine needles grouped together like crystals of sal ammoniac. The m. p. for both forms was 232–233° C.

1. 0.2206 Gm. contained 0.0903 Gm. Au.
2. 0.2368 Gm. contained 0.0970 Gm. Au.
3. 0.2094 Gm. contained 0.0860 Gm. Au.

Found:			*Calc. for* $C_7H_{11}NO_2.HCl+AuCl_3$.
1.	2.	3.	
Au. 40.93 per cent.	41.10 per cent.	41.07 per cent.	40.90 per cent.

Upon recrystallizing the first portion of the double salt obtained from the above-mentioned oxidation product by fractional precipitation with gold chloride, there resulted a small quantity of a gold salt which differed

essentially from scopoline-gold chloride and scopoligenine-gold chloride in appearance as well as in its solubility in water. To obtain somewhat larger quantities of this compound, I repeated the oxidation of scopoline, using 10 Gm. of this base. In this experiment, however, the heating was conducted on a water-bath, and was continued (about 15 hours) until the mixture had assumed a pure green color. Even under these conditions the evolution of a considerable quantity of carbon dioxide could be observed.

After removing the chromium with baryta water, the solution was somewhat concentrated and then precipitated with gold chloride. From the first portions of this precipitate it was possible, by repeated recrystallizations, to isolate a gold salt which crystallized in fine, opaque, pale-yellow, and sometimes peculiarly twisted needles. These were only very slightly soluble in cold water; they melted at 220–222° C.

1. 0.164 Gm. contained 0.0736 Gm. Au.
2. 0.195 Gm. contained 0.0879 Gm. Au.
3. 0.274 Gm. contained 0.1232 Gm. Au.

Found:

Au. 43.78 per cent. 44.87 per cent. 44.97 per cent.

In making the above determinations, the gold was first precipitated by hydrogen sulphide from the hot aqueous solutions of the double salts. When the filtrate from the the gold sulphide, after concentration, was again precipitated with gold chloride, there again resulted a difficultly soluble double salt with the same gold content, but otherwise of entirely different properties than the above-described. It crystallized in small, translucent, weakly lustrous needles, which formed stellate, feather-like groups. The m. p. of this salt was 248–250°. Upon analysis the following data were obtained:

1. 0.1434 Gm. contained 0.0645 Gm. Au., and yielded 0.190 Gm. AgCl.
2. 0.2316 Gm. contained 0.1036 Gm. Au.
3. 0.2300 Gm. contained 0.1034 Gm. Au.
4. 0.3074 Gm. contained 0.2390 Gm. Au.
5. 0.1644 Gm. yielded 0.0995 Gm. CO_2 and 0.0296 Gm. H_2O.
6. 0.1632 Gm. yielded 0.0998 Gm. CO_2 and 0.0280 Gm. H_2O.

Found:

Au.	44.97 per cent.	44.72 per cent.	41.95 per cent.	45.21 per cent.
Cl.	32.77 per cent.			
C.	16.51 per cent.	16.68 per cent.		
H.	2.01 per cent.	1.92 per cent.		

In the above gold determinations the gold was also precipitated as sulphide. The filtrate freed from hydrogen sulphide again yielded the same gold salt.

When the oxidation of scopoline was repeated on the water-bath with

20 Gm. of scopoline, and the oxidation products treated as previously described, the above-mentioned gold double salt, melting at 248–250° C., was directly obtained. The double salt, melting at 220–222° C., which had first resulted when operating upon smaller quantities of scopoline (5 Gm.), did not appear.

Platinum Double Salt. The platinum double salt, corresponding to the gold salt of m. p. 248–250° C., crystallized from fairly concentrated solutions in thin, lustrous, quadratic plates, which melted at 207–208° C. 0.1453 Gm. of the dried salt contained 0.0473 Gm. Pt. = 32.49 per cent.

From the above analytical data the remarkable fact appears that upon oxidizing scopoline an oxygen-free base is formed, very rich in carbon. This indicates that the hydroxyl group in the molecule of scopoline is not attached at the same point as in the molecule of tropine, as reasoning from analogy had led us to assume. Considered with other investigations which have not been quite concluded, the formation of this oxygen-free base may also indicate the point at which the ether-like oxygen atom is fixed in the molecule. It is possible that the further study of this base, which unfortunately can only be produced in small quantities, may completely clear up the constitution of scopoline and of scopolamine.

The product obtained by oxidizing scopoline upon the water-bath contained, besides the above-described oxygen-free base, a large amount of unchanged scopoline; evidently very little scopoligenine had been formed under these conditions. On the other hand, considerable quantities of carbon dioxide and methylamine were formed, which latter was identified by the preparation and analysis of its platinum and gold double salts. Further experiments, the results of which I hope to soon report, will show whether or not, besides carbon dioxide, other nitrogen-free compounds are formed in this oxidation of scopoline.

On motion of Mr. Charles Caspari, Jr., the paper was received and referred for publication.

Mr. Kremers next presented in abstract the following paper by Dr. E. Schaer, of Strassburg, Germany, prefacing his presentation by the remark that Prof. Schaer's residence in Switzerland for a number of years seemed to have made him, as it were, the successor of Schoenbein in his work:

ON THE INFLUENCE OF ALKALINE SUBSTANCES ON VARIOUS OXIDATION PROCESSES.

BY ED. SCHAER, M. D.

The influence exerted by certain alkaline reagents on manifold processes of oxidation has been known for a considerable time. "Oxidations in alkaline solutions" play a not unimportant role, not only in laboratories for organic chemistry, but also in technico-chemical workshops; in dye-works and in other industries in which chemical methods are employed.

In the course of recent years numerous observations and experiments have been made in the Pharmaceutical Institute, in part by myself, in part by my students, all of which lead to the same conclusions, viz., that alkaline substances stimulate oxidation. This fact is true not only of the "strong alkalies" such as potassium and sodium hydroxide and ammonia, but of the weaker alkalies as well. It has been observed even in connection with such substances which are almost or entirely indifferent toward the common indicators. The "activating" influence of certain substances may, therefore, be utilized as a very sensitive indication of their alkaline character.

Inasmuch as several articles* bearing on this subject have been published in part in publications not commonly accessible, this communication may serve as a brief survey of the most important data, thus serving likewise as an introduction to others and also as a means of stimulating further observations. The stimulating effect (for which I should like to suggest the phrase "activating influence") manifests itself, according to my observations, in connection with three sets of reactions:

1. In connection with the oxidizing effect produced, certain metallic salts, more particularly by those of the heavy and noble metals.

2. In connection with those oxidation processes which in modern theoretical chemistry are designated "intra-molecular oxidation," also as "inner combustion." Substances of this class are characterized by the fact that the oxygen contained in them, which is but loosely bound, *i. e.*, in

* The most important of my contributions in which is treated the influence of alkaline substances on oxidation processes are the following:

a. On the oxidizing influence of copper salts.—Archiv der Pharmacie, *239* (1901), 610.

b. On the activating influence of reducing agents, colloidal noble metals, and basic substances on oxidizing agents.—Liebig's Annalen der Chemie, *323* (1902), 32.

c. New observations on the biuret-reaction and on sugar reactions with cupric oxide in alkaline solutions.—Fresenius Zeitschrift f. analyt. Chemie, *42* (1903), 1.

d. On the influence of inorganic and organic alkaline substances on the capacity for oxidation of metallic salts.—Verhandlgn. der naturforschenden Ges. in Basel, xvi (1903), 70.

e. On the increase in the oxidizing influence of certain metallic salts brought about by alkaline substances, more particularly by plant bases.—Archiv d. Pharm., *241* (1903), 401.

f. On the phenomena of spontaneous and inner oxidation.—Verhandlgn. d. Schweizer. naturf. Ges. (Winterthur), 1904.

g. On the influence of alkaline substances on processes of spontaneous oxidation.—Archiv der Pharm., *243* (1905), 198.

Also:

E. Fedler, on the influence of alkaloids on certain oxidation processes.—Archiv d. Pharm., *242* (1904), 680. Extract from inaugural dissertation, Strassburg, 1904, "Beiträge zur Kenntniss der Basicoität der Alkaloide, geprüft an ihren Wirkungen auf gewisse Oxidationsvorgänge."

a condition of special chemical mobility (Schoenbein), becomes more firmly bound by intra-molecular re-arrangement, thus producing more stable compounds. Such substances are guaiac-blue, quinone, benzoyl peroxide, cyanin-ozonide, etc.

3. In connection with spontaneous oxidation processes, whereby a variety of substances take up oxygen from the air and form directly or indirectly (through intermediate peroxides) more or less stable oxidation products.

The phenomena pertaining to these three categories can be observed not infrequently in pharmaceutical laboratories. A number of chemical substances which reveal the phenomena of spontaneous oxidation ("autoxidation") in a particularly striking manner, especially as color changes, are either constituents of medicaments or are closely related to them. It may be regarded as eminently proper, therefore, to discuss these phenomena in pharmaceutical circles, and to direct the attention of the pharmacist to such chemical processes which may be observed in connection with a variety of pharmaceutical-chemical operations, such as the preparation of extracts and tinctures, alkaloidal assays, the isolation of chemical plant constituents, etc.

As to the first class of reactions, viz., the oxidizing influence of metallic salts, especially of the salts of copper, mercury, gold, silver and platinum, we were led to make our observations because of earlier statements made by Prof. Schlagdenhauffen, of the Ecole supérieure de pharmacie of Nancy. He had found that mixtures of solutions of mercuric chloride and guaiac resin, also mixtures of solutions of cupric chloride and pyrogallol, change their color in the presence of even small amounts of several alkaloids. The former solution is colored intensely blue; the latter brown. The blue color was supposed to be connected with the intensive oxidation of a constituent of the guaiac resin, viz., the guaiaconic acid; the brown color with that of pyrogallic acid. My experiences have shown that these cases are but isolated illustrations of a very common phenomenon. The capacity of the above-mentioned metallic salts for the oxidation of greatly-diversified substances is intensified by the presence of inorganic and organic chemical compounds, though they possess but a faint alkaline reaction. We are justified, therefore, to speak of an "activating" influence of numerous substances more or less alkaline.

In order to demonstrate the influences which alkaline substances exert upon the oxidizing properties of metallic salts, a considerable series of oxidizable substances can be employed, of which the following may be mentioned: an alcoholic solution of guaiac resin (1 : 100) : a dilute alcoholic solution of barbaloin (2 : 100); indigo solution, a solution of pyrogallol (1 : 500); a dilute alcoholic solution of guaiacol, solutions of paraphenylene diamine, resorcin, pyrocatechin, orcin, etc. If *e.g.* two solutions of cupric, silver, gold, or platinum salts, used in such dilution, that solutions

of guaiac resin, aloin or guaiacol, when added, will not effect immediate reduction, the subsequent addition of small amounts, *e. g.*, a few milligrams to 25–50 g. of the mixture of various basic substances, will suffice to produce a rapid oxidation of the oxidizable substances enumerated above.* Of weak inorganic basic substances, calcium carbonate, magnesium oxide, alkali acetates and salicylates, of organic bases all of the officinal (Ph.G.) free alkaloids, substituted ammonias, acetanilid, thalloid, piperidine, creatin, lucin, tyrosin and other similar acids, etc., will produce such a result. Coniine, atropine, guaiac, strychnine and codeine, reveal the activating influence in a specially striking manner, whereas narcotine, narceine and colchicine are weaker or even indifferent. However, as weak a plant base as caffeine exerts in many instances a distinct activating influence on some oxidizing metallic salts.

As is well known, the intensely oxidizing action of certain metallic salts in the presence of alkali is due to the activating influence which the latter exert on the former. Well-known illustrations we possess in the action of alkaline solution of cupric salts, of potassium mercuric iodide and mercuric cyanide on glucose and several other sugars, the activated oxidation manifesting itself through the deposition of cuprous oxide and metallic mercury. These are the sugar reactions according to Fehling, Sachse and Knapp. My observations have revealed the remarkable fact that in these reactions the presence of strong alkali, *e. g.*, potassium or sodium hydrate, is not at all a necessity. These reactions occur as well, though somewhat slower and less striking if to the metallic salt solution small amounts of certain free plant bases or substituted ammonias are added previous to the addition of the sugar.† Thus, *e. g.*, a distinct precipitation of cuprous oxide occurs when mixtures of cupric sulphate solution and glucose are heated for some time with coniine, nicotine, atropine, veratrine, etc. Even more striking is the activating influence of plant bases when cupric acetate is used in place of cupric sulphate. It should be added that, as is well known, cupric acetate is reduced by several sugars without any activating agent.

As has already been been pointed out by Schlagdenhaufen, the behavior of different oxidizing metallic salts, especially of cupric and mercuric salts, when aided by faintly alkaline solutions may be used conveniently to decide the question whether in a given instance the experimenter has to

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* When solution of guaiac resin is employed it is expedient to add a few Cc. of chloroform to the mixture. Subsequent shaking will cause the chloroform to dissolve the guaiac blue, and thus to withdraw it from the decolorizing influence of the alkaline substance.

† This is also true of the biuret reaction (cupric salts and sodium hydroxide solution; for albumen, which, however, is not to be regarded as an oxidation process. In this case, also, the sodium or potassium hydroxide can be displaced, *e. g.*, by coniine, atropine and other alkaline organic substances.

deal with a free alkaloid or its salt.* Likewise may these reactions be employed to ascertain whether a small amount of isolated plant substance is to be regarded as an alkaloid on the one hand or a neutral glucoside or a bitter principle, with possibly acid character on the other.

Of no less interest than the activating influence exerted by slightly basic substances on oxidation processes produced by metallic salts, is the influence exerted by numerous even feebly alkaline substances on a series of oxidation processes which have been designated above as "intramolecular oxidation" or "inner combustion." A few illustrations may suffice.

From among those chemical compounds, which contain labile oxygen and, therefore, manifest the phenomenon of inner combustion, the following may be mentioned. Guaiac blue, resulting from the action of ozone or otherwise active oxygen on the guaiaconic acid contained in guaiac resin; aloin red, prepared from isobarbaloin [Léger] or from nataloin through the influence of ozone or ozonoid oxidizing agents; also benzoquinone, $C_6H_4O_2$.

As to guaiac blue, the observations of Schoenbein have long ago demonstrated that in contact with acids and particularly in contact with alkalies it rapidly changes its blue color to a greenish-brown, the change in color being indicative of a corresponding change of the guaiac blue to a more stable oxidation product. These changes are likewise produced, though relatively slower and less complete, by numerous slightly basic substances. The "inner combustion" of the guaiac blue is, therefore, induced by a great variety of chemical impulses, also through the influence of heat and light.

Less striking is the change in connection with aloin red. Not only is it more stable in acid solutions than guaiac blue, but also in alkaline solutions it is not changed as readily. Nevertheless the influence of even weak bases can be demonstrated in connection with this substance.

In a much more striking manner does the intramolecular oxidation reveal itself when quinone is acted upon by alkaline substances. As a matter of fact, this substance possesses remarkable, seemingly contradictory properties.

First, it has the capacity of an oxidizing agent, it colors guaiac resin blue, aloin red, pyrogallol brown, hematoxylin and brasilin solutions are likewise colored red, and acidified starch solution containing iodides blue.

Furthermore, it has the capacity to undergo inner combustion relatively rapidly when in solution, even if air is perfectly excluded, dark-colored products being formed.

Lastly, it has the property to absorb oxygen spontaneously from the air, forming dark-colored oxidation products. These are likewise formed by

* In this connection it should be remembered that certain alkaloidal salts, *e. g.*, morphine acetate dissociate readily and, therefore exert an activating influence. In such cases the test may serve as a means to ascertain the relative stability of alkaloidal salts.

the action of various oxidizing agents. In other words, it may act as a reducing agent.

Observations have revealed the fact that the second property of the quinone, viz., its tendency to intramolecular oxidation, is increased materially by basic substances even though they be but faintly alkaline. Thus, *e. g.*, even good varieties of glass may exert such an influence if a solution of quinone be kept in well-stoppered bottles. This influence is best demonstrated by contrasting it with a like solution preserved in a flask made of quartz.

Other instances of " inner combustion," accelerated in a striking manner by the presence of small amounts of basic substances such as alkaloids, amines, certain amido-compounds, inorganic salts with an alkaline reaction, it might be enumerated, but only a few others may here be mentioned.

Among these are the labile, colorless compound of the cyanin pigment with ozonized oxygen discovered by Schoenbein; also the organic peroxides found in insolated turpentine oil which are changed by inner oxidation with the formation of acids; finally, the spontaneous chemical changes of the labile, superoxide-like compounds which result in certain kinds of slow oxidation of ether or bitter almond oil.

In individual instances the activating influence of alkaline substances on such processes of oxidation may be explained in part by assuming that they exert a predisposing influence, provided that acids result as the products of the intramolecular combustion. This explanation, however, does not fit all cases of known activation produced by alkalies.

Equally apparent is the influence exerted by alkaline substances on processes of spontaneous or slow oxidation. For several years I have studied the activating influence exerted by various strong as well as weakly alkaline substances on a number of organic substances. Among these tannic acid, pyrogallol, quinone, aloin (the isobarbaloin of Léger), chrysarobin and brasilin may be mentioned. These substances are in part homocarbocyclic, in part heterocarbocyclic.

The results of my investigations have recently been published, see " g " of the list of contributions enumerated in the introduction. For this reason, the principal data only need here to be mentioned. Aside from specific deviations, the conclusion could be drawn that basic, even slightly basic substances produce the same stimulation to spontaneous oxidation as to " inner combustion " and to the oxidation brought about by metallic salts.

This becomes especially apparent when three parallel experiments are made with the solutions of oxidizable substances under observation: One is rendered slightly acid by means of an inorganic or organic acid; a second is kept neutral, and to a third a slight amount of the basic substance to be tested is added. Like conditions of access of atmospheric oxygen must be observed, also the ordinary precautions against dust and of oxidizing agents in the atmosphere of the laboratory.

In the majority of the cases those solutions to which alkaline substances had been added became more or less dark in a shorter period than the neutral or acid solutions. Frequently the action was so intense, though but a very feeble alkali had been added, that a deep coloration resulted in a few seconds, whereas the parallel experiments showed a similar color change only after hours or days.

As is well known, gallotannic acid, when slowly oxidized, yields brown oxidation products. In like manner other tannic acids are changed. As recent observations have shown, their oxidation and conversion into so-called phlobophanes is brought about in some parts of plants by oxidation ferments or oxidazes. All of these tannins reveal the peculiarity, long known in pharmaceutical circles, of being colored rapidly in aqueous or dilute alcoholic solution by strong alkalies such as potassium hydroxide, potassium carbonate or ammonia. Experiments with gallotannic acid have shown that more feebly alkaline substances, *e. g.*, magnesium oxide, sodium acetate, quinine, atropine, and veratrine, even in minimal quantities produce a rapid and striking change in the color of the solution.

Even more striking is the change produced in connection with pyrogallol. Its rapid, spontaneous oxidation, especially in alkaline solutions, has long been known to chemists and pharmacists. Less well known is the fact that a rapid and decided coloration of pyrogallol solution to yellowish-brown and even dirty violet-brown may be brought about by very small amounts of plant bases, *e. g.*, a few milligrams of atropine in a 100 Cc. of a solution of 0.25 per cent. strength. Even substances as faintly basic as the xanthine bases theobromine and caffeine will produce similar results.

Equally sensitive with regard to the acceleration of spontaneous oxidation by means of alkalies is quinone (para-benzoquinone), the behavior of which in intramolecular oxidations has already been mentioned. The autoxidation of quinone which takes place, side by side with its inner combustion, when ordinary gaseous oxygen is brought in contact with its solution, is greatly accelerated—as is shown by the increased brown color of the solution—as soon as minimal amounts of even faintly alkaline substances are added. Side by side with other indicators, quinone may therefore be used as one of the most delicate indicators of alkalinity.

Somewhat less striking is the action of alkaline substances as manifested in connection with the spontaneous oxidation of aloin, or rather the isobarbaloin of Léger. Its change to the socalled aloin red brought about by metallic oxidizing agents, also by hydrogen peroxide and induced by means of blood pigment has been demonstrated by me several years ago. *

Nevertheless it can be shown in connection with this substance that even

* See the following:

1. Ueber die Natur der Klungeschen Aloëreaction und die Oxidationswirkungen der Kupfersalze in Gegenwart von Cyanverbindungen.—I u. II., Archiv d. Pharm., 238 (1900), pp. 42 and 279.

small amounts of certain alkaline substances, *e. g.*, coniine, piperidine, triethylamine, and caffeine accelerate materially the process of the slow spontaneous oxidation of solutions of aloin red, *i. e.*, the yellowish color of a solution of 1 per 1000 of isobarbaloin is soon changed to a raspberry-red, whereas the same solution to which a trace of sulphuric or acetic acid has been added remains unchanged for several days.

Chrysarobin, formerly confounded with chrysophanic acid and introduced recently into materia medica as a dermatological agent, behaves in an analogous manner. Indeed, its medical action has been explained because of its intensive capacity for spontaneous oxidation.

The spontaneous oxidation of this substance, which is accompanied by a change of its yellow color to red, is likewise accelerated in the presence of a great variety of alkaline substances. This acceleration is even more marked when heat and light are employed as additional agents.

Concerning brasilin I merely refer to the paper mentioned above (Archiv d. Pharm., 243). In conclusion I desire to call attention to a point which is discussed in detail in this article. Based on the numerous observations regarding the activating influence exerted by ammonium nitrate (in analogous manner to other salts that are readily dissociated, *e. g.*, ammonium acetate, sodium salicylate, morphine acetate, etc.) on oxidation processes of various kinds, I have expressed the opinion that the small amount of ammonium nitrite—shown by Schönbein of Basel to be present in the residue of evaporated water—may play an important role in the evaporation of solutions (*e. g.*, pharmaceutical extracts or dyeing operations). The phenomenon of autoxidation itself is so common that the recognition of the activating influence exerted by even the weakest alkaline substances can no longer be ignored in pharmaceutical operations.

Strassburg, Pharm. Inst. of the University, July, 1905.

Mr. Caspari said he thought the sincere thanks of the Section should be extended to the authors of these two papers so ably presented by Mr. Kremers. They were honorary members of the Association, living in a foreign land, who had taken the pains to prepare these very interesting contributions to the work of the Section, and he thought some recognition should be made.

The Chair asked if Dr. Power was included in that suggestion for his valuable paper, and Mr. Caspari answered in the affirmative, although he said Dr. Power was an active member of the Association. The Chair stated that, without objection, it would be understood that the Secretary be instructed to attend to this matter, and it was so ordered.

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2. Ueber Guajakblau und Aloinroth.—Verhandlgn. der Basler Naturf. Ges., viii (1901), p. 287.

3. Ueber Blutreactionen mit Guajakharz und Aloin.—Fresenius. Ztschr. f. anal. Chem., 42 (1903), p. 1.

Mr. J. O. Schlotterbeck presented a paper on the Chemistry of Chelidonine, after explaining that he had not expected to be at the meeting until the last minute, on account of illness in his family, and had neglected to bring with him some seven or eight crystalline preparations that he desired to show the members.

CONTRIBUTION TO THE CHEMISTRY OF CHELIDONINE.

J. O. SCHLOTTERBECK AND BURTON S. KNAPP.*

As brought out in previous papers,† chelidonine is the principal alkaloid of chelidonium majus and stylophorum diphyllum, two closely related plants of the papaveraceæ. At the time this investigation was begun our knowledge concerning this alkaloid was practically limited to the following facts: That its composition is $C_{20}H_{19}NO_5 + H_2O$, its melting-point 136° C., that one hydroxyl is present, that it contains a NCH_3 group, and that crystals of the free base are markedly triboluminescent.

Several attempts have been made during the past twenty years to gain an insight into the constitution of chelidonine. The first work upon the oxidation products of chelidonine was done by Henschke.‡ He obtained by the action of potassium permanganate in acid and alkaline solutions, oxalic acid, carbon dioxide, methylamine and ammonia, but no intermediate bodies with larger percentages of carbon. Upon the results of Henschke, Selle § probably based the opinion that chelidonine was closely related to morphine in structure. The physiological action of chelidonine certainly gave support to this view, and perhaps led to the assumption of Brühl ‖ that these two alkaloids are closely related chemically. Later Wintgen ¶ published a lengthy article upon the constitution of chelidonine, but did not obtain any positive new results. In all cases it was found that in attempting to split up the base into simpler compounds the action was either too destructive or there was practically none at all. It is possible that in all the instances cited very small quantities of decomposition products were obtained that might be of value in determining at least a part of the structure of this alkaloid, but the quantity of material available may have been too small.

DISTILLATION WITH ZINC DUST.

As the reputed relation of chelidonine to morphine was based entirely upon analogy, we first took up the distillation of chelidonine with zinc dust to determine if, like morphine, we would obtain phenanthrene. The

* Holder of Frederick Stearns & Co. Fellowship in Pharmaceutical Chemistry.

† Proceedings A. Ph. A., *49*, 251; Proceedings A. Ph. A., *51*, 321.

‡ Arch. der Pharm.

§ Dissertation, Erlangen, 1889.

‖ Brühl, Alkaloide.

¶ Dissertation, Marburg, 1898.

operation was carried on exactly as given by Vongerichten * in his work on morphine and along with morphine as a control. 10 Gm. alkaloid were intimately mixed with 100 Gm. zinc dust and rapidly distilled from a hard-glass tube. In every one of the six or more trials abundant evolution of pyrrhol, amines and ammonia was proved. A small amount of a syrupy, transparent distillate from the chelidonine was collected, dissolved in ether and repeatedly shaken with very dilute hydrochloric acid. The residue from the combined ether solutions was then distilled with steam. From morphine at least ten times as much product was obtained as from chelidonine. While phenanthrene was easily identified in the product obtained from morphine, it could not be identified in the product from chelidonine.

ACTION OF HYDROCHLORIC ACID UNDER PRESSURE.

Selle made several attempts to make apochelidonine in the same manner that apomorphine is made, viz., by heating with strong hydrochloric acid in a sealed tube. He found that a temperature of 100° C. scarcely affected the alkaloid, since he recovered unchanged practically the entire amount taken. A temperature of 150° C. for three hours almost completely carbonized the alkaloid.

The action of hydrochloric acid upon chelidonine was studied by us in a different manner. From 8–10 Cc. conc. hydrochloric acid were added to 5 Gm. chelidonine in a wide-mouthed flask surrounded by a freezing mixture registering –20° C., and dry hydrochloric acid passed into the mixture, constantly agitated, for about one and one-half hours. The chelidonine finally dissolved to a syrupy, golden-yellow liquid. This was transferred to a hard-glass tube also surrounded with freezing mixture and the tube sealed. In order to determine, if possible, at what temperature a visible change took place, the tube was supported vertically in a wide-mouthed Erlenmeyer flask filled with glycerine, and gradually heated. The flame was so regulated that a temperature of 70° C. was attained at the end of 2½ to 3 hours. It was at this temperature that a marked change took place, viz., the liquid became dark greenish-blue in color and a considerable amount of amorphous substance separated throughout the liquid. The tube was allowed to cool slowly, then placed in a freezing mixture at –20° C., and the capillary opened. Even at this low temperature quite a little pressure was noticed. The gas was collected and tested for methyl chloride, but the result was a negative one.

In a later experiment it was accidentally discovered that the same result could be obtained by merely allowing the tube with contents to stand for 6–8 days at room temperature. The change seemed to begin after the third day, and was completed at the end of the eighth day.

The contents of the tube was poured into a Buchner funnel and rapidly

* Annalen, *210*, 396.

filtered with suction. A few drops of alcohol were poured over the precipitate and then ether to completely dry the powder, which was of a pale-green color. This powder is very soluble in water, forming a reddish solution. It is also very soluble in alcohol. From its solutions it is readily precipitated in a nearly white condition by dry hydrochloric acid gas. This amorphous hydrochloride, which was at first thought to be apochelidonine, could not be obtained in crystalline form, although many different solvents were used in the endeavor. When treated with a fixed alkali, the base is at first thrown out of its aqueous solution in the form of a gelatinous-flocculent precipitate, but is redissolved on the addition of an excess. Upon shaking out this solution with ether no free base, or, at most, the merest traces could be obtained. The free base was found to be amorphous and easily oxidizable.

A benzoyl compound was readily made by the Baumann-Schotten method. Great difficulty was experienced in purifying this compound, in fact, it was not possible to get it sufficiently uniform to obtain concordant combustions. Platinum and gold compounds were made of the benzoyl compound, but they were also amorphous. By incinerating these compounds, dried at 100° C., results were obtained that corresponded fairly well for tri-benzoyl-chelidonine. Further work on the action of hydrochloric acid on chelidonine was abandoned for the reason that the compounds were all amorphous, difficult to separate and purify.

ACTION OF PCl_5 ON CHELIDONINE.

To 10 Cc. dry chloroform 2 Gm. PCl_5 was added, and then 5 Gm. chelidonine, dried at 100° C., slowly added. Considerable heat was generated as well as fumes of hydrochloric acid. The temperature was kept down by keeping the flask in ice water. A yellow to orange-colored solution was produced, and this set aside for from twelve to twenty-four hours. Owing to the evaporation of the chloroform the liquid finally assumed a varnish-like consistency. This varnish was very slowly poured into a large volume of cold water under constant stirring. After a time the oily precipitate balled up into a grayish-white sticky mass, and the supernatant liquid assumed a greenish-yellow color. The filtrate was made alkaline with ammonia, when a voluminous precipitate was thrown out. This was then shaken with ether, which dissolved practically all of the precipitate. From the solution, which was fluorescent, not a particle of chelidonine separated on evaporation and standing. Instead, a varnish-like residue was obtained, which when tested for chlorine by Carius' method, gave positive evidence that chlorine had been introduced into the molecule. All attempts to crystallize this chlorine derivative were futile. After purifying a number of times by dissolving in acetic acid, making alkaline with ammonia and washing with water, the product was obtained in the form of a pure-white powder. A number of chlorine determinations with excellent results

pointed to the replacement of hydroxyl by chlorine, with the formation of chlor-chelidonid $C_{20}H_{18}ClNO_4$, corresponding to chlor-iodid derived from codeine.

The mass obtained by pouring the varnish-like mixture above spoken of into water was dissolved in dilute acetic acid, made alkaline with ammonia and shaken out with ether also. Practically everything went into solution with a bluish fluorescence. This fluorescence was at first thought to be characteristic of this substance, but was found later to be a contamination, since by dehydrating the fluorescent ether solution with calcium chloride the fluorescence disappeared and a small amount of a dirty-colored substance fell to the bottom. It seems that this fluorescent body is soluble in the small amount of water that is held in solution by the ether. There was some evidence, though not entirely conclusive, that calcium chloride forms a crystalline compound with the basic substance. After thoroughly and repeatedly purifying the basic substance in the ether solution as before described the amount of chlorine was determined in a weighed quantity, and it too corresponded with the formula for chlor-chelidonid.

The above experiment with PCl_5 was made a number of times under different conditions, particularly with reference to the time element. It seems that when this mixture is allowed to stand at room temperature for about 12 hours nearly the entire product is chlor-chelidonid, but when allowed to stand for a longer period the action of the PCl_5 is more energetic. If the mixture of chelidonine, PCl_5 and chloroform be allowed to stand from 36 to 48 hours or more the varnish-like residue becomes more and more orange-red in color and in some instances a bright-red precipitate is formed. Upon carefully separating this red compound it was found to be soluble in hot water and if the solution was sufficiently concentrated the compound again separated in beautiful red needles. The solution of this red compound when made alkaline with ammonia threw down a nearly white precipitate and the liquid became colorless. The whitish base is almost completely soluble in ether and possesses a fluorescence such as is noticed when the alkaloid sanguinarine is freshly precipitated and dissolved in ether. On allowing the ether solution to stand, beautiful colorless crystals separate. It is extremely difficult to obtain the free basic crystalline substance in a perfectly colorless condition since short contact with the air causes it to turn red. The quantity of this interesting compound obtained by this cold method is so very small that no extended investigation could be attempted. Therefore a modification of this process was employed and with much better success. The details will be given later.

The supernatent orange-yellow varnish-like liquid, which has been separated from the reddish deposit above spoken of, was dissolved in dilute acetic acid with moderate heat, diluted with water, and precipitated with ammonia water. The very heavy, flocculent precipitate was shaken out with ether in the usual manner and complete solution with bluish fluores-

cence obtained as before. This ether solution was dehydrated to remove the fluorescent body and divided into two portions. One was set aside to crystallize, but with negative result. The other was again precipitated from ether solution with dry hydrochloric acid gas. The precipitate was snow-white but upon collecting in a Buchner filter with suction the edges of the alkaloid mass began to turn bright-red. This was plainly an oxidation by the oxygen of the air of some substance differing from chlor-chelidonid since the latter manifested no such change during all the many manipulations to which it was subjected. Furthermore this white hydrochloride when treated with oxidizing agents, such as a chloroformic solution of iodine or bromine, was instantly partly oxidized to the red compound. The filtrate from this red compound when treated and purified in the usual manner gave principally an amorphous hydrochloride that corresponded exactly with chlor-chelidonid. Although not absolutely verified by analyses it seems quite probable that PCl_5 acting in the cold for different lengths of time upon chelidonine forms first chlor-chelidonid by replacing the hydroxyl with chlorine, second a compound of the nature of a leuco-base, which is further oxidized to the crystalline colorless compound that gives blood-red salts with acids.

In order to verify this assumption larger quantities of the last mentioned compound were necessary since it is the only one of the three that crystallizes and can be obtained pure enough for analysis. This was obtained as follows:

Five Gm. chelidonine dried at 100° C. and five Gm. PCl_5 were placed in a 125 Cc. round-bottom flask whose neck was fused to the inner tube of a condenser. The whole apparatus was supported in an upright position and 25 Cc. dry chloroform gradually poured into the flask. Violent effervescence takes place and fumes of HCl are given off. Solution is finally effected and heat is gradually applied by means of a naked flame. The liquid is boiled 20–30 minutes and then allowed to cool. In a short time and sometimes even during boiling a bright-red crystalline substance accumulates in the bottom of the flask. When cool the supernatent light-yellow liquid is poured off, the chloroform distilled off and the residue dissolved in dilute acetic acid. Ammonia water is then added to alkalinity and the voluminous precipitate separated by filtration and carefully dried. An additional quantity of the red crystalline substance can be obtained from this by repeating the operation of heating with PCl_5 and chloroform or by dissolving the dry precipitated white basic substance in dry chloroform and adding carefully a chloroformic solution of iodine or bromine until no more of the red substance is thrown out. This operation can be performed a third time with profit.

From the supernatant liquid remaining a mixture of chlor-chelidonid and the leuco compound, which upon oxidation yields the crystalline body that turns bright red with acids, can be obtained. The separation of these two amorphous bodies offers considerable difficulties, however.

The preparation of the crystalline free base is attended with the loss of so much material that a sufficient quantity was not available to make an extended study. Its melting-point was determined to be 242° C.

Many combustions were made of the pure red hydrochloride, but owing to the presence of the halogen great difficulty was experienced in completely burning the compound. In fact, the results were not entirely satisfactory, and therefore not given. A number of the results pointed to $C_{20}H_{17}ClNO_4,HCl$, and others to $C_{20}H_{15}ClNO_4,HCl$, as the composition of this compound. From the fact that the first effect of PCl_5 is to replace the hydroxyl with chlorine, and that further action produces a colorless compound that is easily oxidized to a compound that gives red salts with acids, we are inclined to believe that the latter formula, viz.: $C_{20}H_{15}ClNO_4$, HCl, represents the composition of the dried red salt. If it can be demonstrated that the latter formula is the correct one, then it follows that the intermediate compound, which is easily oxidized to the color compound, is one atom of hydrogen poorer than chlor-chelidonid, viz., $C_{20}H_{17}ClNO_4$. This compound then is in the nature of a leuco base, which by oxidation loses 2H, giving the formula, $C_{20}H_{15}ClNO_4,HCl$.

Repeated determinations of the loss in weight by drying to constant weight, show conclusively that this red crystalline hydrochloride has 5 molecules of water of crystallization, viz., $C_{20}H_{15}ClNO_4,HCl+5H_2O$.

A platinum salt was made by dissolving the red hydrochloride in water, acidulating with hydrochloric acid, adding platinum chloride solution, filtering, washing and drying the precipitate. All attempts to crystallize this salt proved futile. The following results were obtained:

1. Wt. of dry material, .1290. Wt. of Pt., .0206.
2. Wt. of dry material, .1159. Wt. of Pt., .0188.

Calculated for $(C_{20}H_{15}ClNO_4,HCl)_2PtCl_4$.

1. .0219.
2. .0196.

The gold salt of the red hydrochloride was made in the same manner, and the following results obtained:

1. Wt. of dry material, .1399. Wt. of Au., .0375.
2. Wt. of dry material, .0932. Wt. of Au., .025.

Calculated for $C_{20}H_{15}ClNO_4,HCl,AuCl_3$,

1. .0388.
2. .0259.

Chlorine determinations were repeatedly made with the red hydrochloride that had been heated in an air-bath to constant weight. The first method employed was that of Pringsheim by means of sodium peroxide. After many attempts and varying the relative quantity of peroxide, it was found that by this method only the additive chlorine of the hydrochloric

acid could be determined. By using a modification of Carius method and heating to 350° C. for five or six hours the oxidation was complete.

1. Wt. of dry material, .0294.	Wt. of AgCl, .0811.
2. Wt. of dry material, .118.	Wt. of AgCl, .077.
3. Wt. of dry material, .1386.	Wt. of AgCl, .090.

	Calculated for 2Cl.	Theory.
1.	.02004	.02186
2.	.01903	.02065
3.	.0222	.02425

$C_{20}H_{15}ClNO_4HCl$

It was repeatedly proved by the determinations of chlorine by Pringsheim's method, as well as by direct precipitation of an aqueous solution of the red hydrochloride with silver nitrate solution that one-half of the chlorine is combined as HCl. It is very evident that the molecule of the red hydrochloride contains but one substituted chlorine.

ACTION OF ZINC AND HCL.

When an aqueous solution of the red hydrochloride is treated with zinc and hydrochloric acid or sulphuric acid, the solution gradually becomes colorless. If this colorless solution be made alkaline with ammonia a white precipitate is thrown out, which is easily soluble in ether. After dehydrating in the usual manner or with fused potassium sulphate dry hydrochloric acid throws out a voluminous white precipitate. This was not subjected to analysis because it cannot be obtained in a crystalline form, but it was assumed to be the intermediate compound which was obtained by the action PCl_5, viz., $C_{20}H_{17}ClNO_4H_2O$. If this assumption be true we should obtain by the action of bromine, chlorine, iodine, or PCl_5, the red salt first taken. This was found to be actually the case, and the crystalline body was obtained of same properties as the original red body.

FUSION WITH ALKALI.

Chelidonine and KOH were fused together in a nickel crucible in the usual manner. After a homogeneous melt was obtained the contents of the crucible was dissolved in water. The dark-red solution was acidulated with H_2SO_4 and the dark-brown precipitate which was thrown out, filtered. The filtrate was evaporated to syrupy consistency and then treated with strong alcohol to remove K_2SO_4. Filtrate was evaporated to dryness on the water-bath and the residue dissolved in water and shaken out with ether. The ether solution was dried over $CaCl_2$ and then evaporated to dryness. The residue assumed the form of minute colorless crystalline needles. The solution gave a deep blue color on the addition of $FeCl_3$ and a red color upon further addition of NaOH. Lead acetate solution gave a dark greenish-blue precipitate soluble in acetic acid. Silver nitrate solution was

quickly reduced. No reduction was obtained with Fehling's solution. There was not sufficient of this crystalline substance to take a melting-point.

ACTION OF NITRIC ACID.

The intermediate or leuco base was dissolved in glacial acetic acid about two volumes, and to this was added an excess of strong nitric acid. The solution at first is bright red ; but upon standing in the cold, and more completely when warmed, the solution becomes practically colorless. From time to time more nitric acid was added as long as a red color was produced. Finally the liquid is evaporated and relatively large colorless crystals of a non-nitrogenous acid separate. The production of this acid in the cold requires several weeks' time. The acid liquid effervesces some and finally becomes more or less resinous, but in the mixture large prismatic crystals may be seen with the naked eye. The crystals were purified by making a lead salt and decomposing with H_2S. After purification the crystals were found to melt above 300° C. at which temperature they began to sublime. Nothing further could be attempted with these crystals at this time.

SUMMARY.

1. Chelidonine does not yield phenanthrene upon distillation with zinc dust.

2. When chelidonine is saturated with hydrochloric acid at —20°, and heated in a sealed tube, apo-chelidonine is not formed, but possibly amorphous tri-chelidonine.

3. When chelidonine is treated with PCl_5, chlor-chelidonid, $C_{20}H_{18}ClNO_4$, is first formed, then a leuco-chlorinated compound, $C_{20}H_{17}ClNO_4$, and finally a bright red crystalline mono-chlor derivative, $C_{20}H_{15}ClNO_4.HCl$. The free base is colorless, crystalline, and melts at 242° C. The red compound is reduced by zinc and hydrochloric acids to the leuco base, and this is again oxidized to the red compound with PCl_5, bromine, chlorine or iodine.

4. Fusion with alkali splits up chelidonine with the formation of amines and a crystalline compound, giving reactions for protocatechuic acid.

5. Strong nitric acid in the cold breaks up chelidonine with the formation of a non-nitrogenous acid melting above 300° C. and subliming at this temperature.

In conclusion we wish to take this opportunity of expressing our thanks to Messrs. Merck & Co., New York City, who kindly furnished the pure alkaloid for this investigation. The work will be continued as fast as the alkaloid can be prepared, Messrs. Merck & Co. having generously offered to furnish further quantities of chelidonine for its continuance.

The thanks of Messrs. Frederick Stearns & Co. are also here expressed for their generosity in furnishing the funds necessary for the prosecution of the work.

School of Pharmacy, University of Michigan.

The Chair stated that, without objection, the paper would take the usual course. There was no discussion of the paper, though discussion was invited by the Chair.

The following paper on Calycanthus Glaucus, by H. M. Gordin, was read by title and referred, in the absence of the author.

ON THE CRYSTALLINE ALKALOID OF CALYCANTHUS GLAUCUS.

Second Paper.*

BY H. M. GORDIN.

The subject of this paper is a continuation of the research upon the alkaloid calycanthine, the active principle (according to Cushny †) of Calycanthus glaucus.

In the first paper it was shown that the formula of calycanthine is $C_{11}H_{14}N_2+\frac{1}{2}H_2O$; that the alkaloid is a weak monoacid base forming a chloroplatinate of normal composition and combining with one molecule of the halogen acids, and that it gives some very characteristic color reactions.

In the present paper I wish to report upon the preparation and analysis of the salts of calycanthine with the ordinary oxyacids, with chlorauric acid and mercuric chloride, and upon the first attempts to get some idea of the constitution of the alkaloid.

It will be noticed that the analytical figures for the acid part of those salts which could not be washed with the solvent in presence of free acid, as in the case of fixed acids and nitric acid, are generally slightly too low, showing that some acid is lost upon washing away the mother liquor.

Calycanthine Nitrate, $C_{11}H_{14}N_2.HNO_3$.—As a monoacid base calycanthine combines with one molecule of nitric acid.

Like the other salts of calycanthine, the nitrate can be recrystallized only in the presence of some free acid, but the nitric acid must be washed away completely before drying the salt, otherwise it becomes green even when dried in vacuum over calcium oxide.

For this reason it is difficult to obtain a nitrate containing the exact theoretical amount of nitric acid, some of the acid being washed away in washing the salt with the neutral solvent.

The best way to prepare a nitrate containing almost the full amount of acid required by theory is as follows: The calycanthine is dissolved in ten times its amount of acetone, and to the solution is added a slight excess of nitric acid diluted with double its amount of water. On standing over night most of the nitrate crystallizes out. The crystals are washed with acetone and dried at ordinary temperature. 2 Gm. of the salt are then dissolved in 30 Cc. hot water, and after cooling the solution to about 60°

* For first paper see Proc. Amer. Pharm. Assoc., 1904, page 345, and Journ. Amer. Chem. Soc., 1905, page 144.

† Journ. Am. Chem. Soc., 1905, page 155.

C. it is carefully covered with a mixture of 2 Cc. dilute nitric acid and 73 Cc. acetone. The crystals which separate out after 12 hours' standing are washed with a little acetone (avoiding too much unnecessary washing, but nevertheless removing all the free acid adhering to the crystals) and dried in vacuum over calcium oxide.

The nitrate forms short, stout, snow-white, hard prisms; is very difficultly soluble in cold water and cold alcohol, but easily soluble in hot water or hot alcohol. Almost insoluble in acetone. When heated it assumes a yellow color at 202° C., and melts at 208° to 209° C. to a red liquid which very soon becomes black.

In the absence of free acid the nitrate can be boiled with water without changing color, but in presence of free mineral acid the hot liquid immediately becomes green. In the cold the color is developed only slowly when only little free acid is present.

0.14545 Gm. substance gave 22.4 Cc. $N(b = 747, t = 19°)$.

0.09975 Gm. substance gave 15.8 Cc. $N(b = 742, t = 23°)$.

Calculated for $C_{11}H_{14}N_2.HNO_3$: 17.75 per cent. N, found 17.39 and 17.42 per cent. N.

That the nitrate loses more acid when recrystallized in absence of free nitric acid was shown by an estimation of nitrogen in a sample which had been recrystallized from hot water without the addition of nitric acid. 0.1451 gram of this sample gave 21.1 Cc. $N(b = 742, t = 19°)$. This corresponds to 16.30 per cent. N, against 17.75 per cent. required by theory.

Calycanthine Sulphates.—Calycanthine forms two sulphates, an acid sulphate containing two molecules of water of crystallization and a neutral sulphate containing two-and-a-half molecules of water of crystallization.

The acid sulphate can be made by treating calycanthine with an excess of sulphuric acid, using absolute alcohol or acetone as a solvent. The neutral sulphate is formed when dilute sulphuric acid is treated with an excess of the alkaloid, using water as a solvent. Owing to the very difficult solubility of the free alkaloid in cold water the excess of the base can be filtered off, and the filtrate will contain the neutral salt in solution with only a trace of the free calycanthine.

Both sulphates are extremely easily soluble in water, but very difficultly soluble in alcohol and almost completely insoluble in acetone. The presence of much free acid diminishes considerably the solubility of the sulphate in cold water. (The same is true of the hydrochloride, which is considerably less soluble in presence of much free hydrochloric acid than in water alone.)

Both sulphates are hygroscopic, and if weighed out for analysis on wet days will be found to contain a little more water than is required theoretically, unless the salts are kept in a dry atmosphere. In vacuum over sulphuric acid both sulphates very soon lose all their water of crystallization,

which they reabsorb on exposure to the ordinary atmosphere. The crystalline acid sulphate does not change color on standing, but when the water of crystallization is removed from the salt it assumes a yellowish tint. On exposing the yellowish anhydrous acid sulphate to the atmosphere it quickly absorbs water and again becomes snow-white.

The neutral sulphate on standing exposed to the atmosphere assumes a yellowish tint, but if kept in vacuum does not change color on losing its water of crystallization.

Calycanthine Acid Sulphate, $C_{11}H_{14}N_2.H_2SO_4 + 2H_2O$.—3 Gm. calycanthine were dissolved with the aid of a gentle heat in 12 Cc. not very dilute sulphuric acid (25 per cent.), and after adding to the still warm liquid 50 Cc. absolute alcohol it was set aside in a cool place. Crystallization began very soon, and after about 24 hours most of the acid sulphate crystallized out. The crystals were washed with absolute alcohol (avoiding too much washing) and dried at about 25° C. in the air.

The acid sulphate forms beautiful snow-white, soft, silky needles showing double refraction. When quickly heated to 76° C. the acid sulphate melts in its own water of crystallization to a thick, turbid liquid; on further heating the turbidity disappears at about 186° C. but not very sharply. The lack of sharpness in the melting-point of the crystallized acid sulphate is most probably due to a gradual loss of water of crystallization. The anhydrous acid sulphate melts sharply at 184° C., after having become brown at 180° C.

0.30875 Gm. substance lost in vacuum over sulphuric acid 0.03605 Gm. H_2O and gave 0.22565 Gm. $BaSO_4$.

0.2989 Gm. substance lost in vacuum over sulphuric acid 0.0358 Gm. H_2O and gave 0.2181 Gm. $BaSO_4$.

Calculated for $C_{11}H_{14}N_2.H_2SO_4 + 2H_2O$: 11.68 per cent. H_2O and 10.40 per cent. S′, found: 11.68 and 11.90 per cent. H_2O; 10.04 and 10.02 per cent. S.

Calycanthine Neutral Sulphate, $(C_{11}H_{14}N_2)_2.H_2SO_4 + 2\frac{1}{2}H_2O$.—Digest 2.5 Gm. calycanthine on the water-bath for half an hour with 25 Cc. of very dilute sulphuric acid (2 per cent.), cool the mixture to about 15° C. and filter off from undissolved base. Add to the filtrate 100 Cc. acetone and set it aside. In a very short time the whole liquid is converted into a mass of crystals. Wash the crystals with acetone, avoiding too much unnecessary washing, and dry them in the air at about 25° C.

The neutral sulphate crystallizes in the same form as the acid salt; the crystals of the neutral salt seem to be only a little thicker than those of the acid salt. Unlike the acid sulphate the crystallized neutral sulphate does not melt in its water of crystallization but melts at 226° to 227° C. The anhydrous neutral sulphate melts at 229° C.

0.1887 Gm. substance lost in vacuum over sulphuric acid 0.117 Gm. H_2O and gave 0.08885 Gm. $BaSO_4$.

0.17595 Gm. substance lost in vacuum over sulphuric acid 0.01665 Gm. H_2O and gave 0.08085 Gm. $BaSO_4$.

Calculated for $(C_{11}H_{14}N_2)_2.H_2SO_4 + 2\frac{1}{2}H_2O$: 9.16 per cent. H_2O and 6.52 per cent. S; found: 9.01 and 9.46 per cent. H_2O; 6.47 and 6.31 per cent. S.

Calycanthine Chloraurate.—Owing to the easy reduction of calycanthine chloraurate the salt can be prepared only in presence of considerable free hydrochloric acid and must be washed with water containing hydrochloric acid. Under these conditions a definite chloraurate is formed having the somewhat unusual formula $3(C_{11}H_{14}N_2.HCl.AuCl_3) + 2C_{11}H_{14}N_2.HCl + 2\frac{1}{2}H_2O$. As indicated by this formula the chloraurate is made up of the regular salt combined with calycanthine hydrochloride. This possibly accounts for the fact that when the chloraurate is dissolved in alcohol and the solution covered with ether calycanthine hydrochloride, not the chloraurate, soon crystallizes out. Attempts to make a normal chloraurate by using an excess of gold chloride and pouring the solution of calycanthine hydrochloride into the solution of gold chloride instead of *vice versa*, showed that under all conditions only one chloraurate is formed, having the composition given above.

One Gm. calycanthine was dissolved in 50 Cc. dilute hydrochloric acid (5 per cent.), and to the solution was added a solution of gold chloride in dilute hydrochloric acid (5 per cent.) till further addition caused no more precipitation. After standing a few hours the chloraurate was washed with dilute hydrochloric acid (5 per cent.) and dried at about 25° C.

The chloraurate forms beautiful orange-colored microscopic needles, possessing strong dichroism (orange and yellow) and containing two and a half molecules of water of crystallization. When kept in vacuum over dehydrating agents the salt loses all its water of crystallization in a few days and assumes a dull cinnamon color. On exposing the anhydrous salt to the ordinary atmosphere it quickly absorbs water and regains the orange color. The crystalline chloraurate melts at 191° to 192° C. to a thick turbid liquid which does not become clear even when heated to 250° C. The anhydrous salt melts at 196° C.

For an estimation of water of crystallization the air-dried (25°) substance was used.

0.33345 Gm. substance lost in vacuum over sulphuric acid 0.00765 Gm. H_2O.

0.3427 Gm. substance lost in vacuum over sulphuric acid 0.0076 Gm. H_2O.

Calculated for $3(C_{11}H_{14}N_2.HCl.AuCl_3) + 2C_{11}H_{14}N_2.HCl + 2\frac{1}{2}H_2O$: 2.24 per cent. H_2O, found: 2.22 and 2.29 per cent. H_2O.

For an estimation of gold, chlorine and nitrogen the anhydrous chloraurate was used.

0.16405 Gm. substance gave 0.0497 Gm. Au.

0.1629 Gm. substance gave 0.0498 Gm. Au.

0.1686 Gm. substance gave 0.1730 Gm. AgCl.

0.21945 Gm. substance gave 0.2257 Gm. AgCl.

0.2165 Gm. substance gave 13.8 Cc. N ($b = 752$, $t = 20.5°$).

Calculated for $3(C_{11}H_{14}N_2.HCl.AuCl_3) + 2C_{11}H_{14}N_2.HCl$: 30.52 per cent. Au; 25.27 per cent. Cl; 7.15 per cent. N. Found: 30.29 and 30.57 per cent. Au; 25.37 and 25.43 per cent. Cl; 7.19 per cent. N.

In order to show that even using a large excess of gold chloride, and pouring the solution of calycanthine hydrochloride into the gold chloride solution, the same chloraurate is formed, a solution of 1 Gm. calycanthine hydrochloride in 50 Cc. dilute hydrochloric acid (5 per cent.) was poured slowly with constant stirring into a solution of 5 Gm. gold chloride in 25 Cc. dilute hydrochloric acid (5 per cent.). The salt made in this way had the same appearance and behaved in every respect like the chloraurate made by the other method. An estimation of gold and chlorine in this sample also showed it to be identical with the other salt. For analysis it was dried in vacuum to constant weight.

0.2318 Gm. substance (anhydrous) gave 0.07075 Gm. Au.

0.16445 Gm. substance (anhydrous) gave 0.16555 Gm. AgCl.

Found: 30.52 per cent. Au and 24.90 per cent. Cl.

On digesting 1 Gm. calycanthine chloraurate with 25 Cc. dilute hydrochloric acid (10 per cent.) over night at a temperature of 70° to 80° C. beautiful yellow scintillating spangles of metallic gold separate out. The appearance of these spangles in the reddish liquid is very pretty. The calycanthine in this reaction must be converted into some oxidation-product, which it would be interesting to investigate. But owing to the costliness of the reagent a fuller investigation of this reaction is postponed for a future date.

As was shown in the first paper,* and mentioned above, from an alcoholic solution of calycanthine chloraurate ether separates out calycanthine hydrochloride. It would be interesting to investigate whether the normal chloraurate or simply gold chloride is left in the ethereal solution. This problem, too, is left for a future investigation.

Calycanthine Picrate, $C_{11}H_{14}N_2.C_6H_2(NO_2)_3.OH + \frac{1}{2}H_2O$.— 1 Gm. calycanthine was dissolved in 100 Cc. water containing one per cent. sulphuric acid, and to the solution was added an excess of a saturated solution of picric acid and enough water, till upon heating the liquid to boiling a clear solution was obtained (about 2000 Cc. water were required). The solution was set aside at ordinary temperature. After 48 hours the picrate was washed with a little water and dried at about 25° C.

The picrate forms very pretty long and flat silky needles having a shining yellow color. It is very difficultly soluble in cold water or cold alco-

* Journ. Am. Chem. Soc., 1905, page 149.

hol, a little more soluble in hot water. At 160° C. the salt begins to lose its shining appearance, assuming a livid tint and melts at 185° C. to a black liquid. It loses its water of crystallization in vacuum over sulphuric acid and then melts at 186° to 187° C.

0.21235 Gm. substance (air-dried) lost in vacuum over sulphuric acid 0.00472 Gm. H_2O and gave 31.7 Cc. N (b = 759, t = 17°).

0.1705 Gm. substance (air-dried) lost in vacuum over sulphuric acid 0.0032 Gm. H_2O.

Calculated for $C_{11}H_{14}N_2.C_6H_2(NO_2)_3.OH + \frac{1}{2}H_2O$: 2.18 per cent. H_2O and 17.02 per cent. N; found: 2.22 and 1.88 per cent. H_2O; 17.31 per cent. N.

Calycanthine Oxalates.—As a monoacid base calycanthine ought to form a neutral and an acid oxalate. A neutral oxalate of normal composition, $(C_{11}H_{14}N_2)_2.H_2C_2O_4$, can be easily prepared by treating oxalic acid with an excess of calycanthine in acetone solution. The neutral oxalate being difficultly soluble in cold acetone soon crystallizes out, leaving the excess of free base in the acetone solution.

An acid oxalate of normal composition $C_{11}H_{14}N_2.H_2C_2O_4$, I was not able to prepare. On treating calycanthine with an excess of oxalic acid a compound is formed which contains more acid than is required for the formation of the neutral oxalate but less than is required for the formation of the acid oxalate of normal composition. The compound seems to be a combination of the acid oxalate and the free base and to correspond to the formula, $3(C_{11}H_{14}N_2.H_2C_2O_4) + C_{11}H_{14}N_2 + 2\frac{1}{2}H_2O$.

Calycanthine Neutral Oxalate, $(C_{11}H_{14}N_2)_2.H_2C_2O_4$.—1 Gm. crystallized oxalic acid was dissolved in 15 Cc. hot alcohol and the solution poured into a warm solution of 3.5 Gm. calycanthine in about fifty Cc. acetone. After 24 hours the crystalline neutral oxalate which separated out was washed with a little acetone and dried at 25° C.

The neutral calycanthine oxalate crystallizes in small white needles which are difficultly soluble in cold water or cold alcohol, easily soluble in hot water or hot alcohol. On prolonged exposure to the atmosphere the salt assumes a yellowish tint. Upon heating, the salt commences to darken at 195° C., and at 231° C. melts with effervescence.

For an estimation of oxalic acid the neutral oxalate was dissolved in hot water and decomposed by means of calcium acetate. The precipitated calcium oxalate was then titrated in the usual way with standardized potassium permanganate of which each Cc. was equivalent to 0.003931 Gm. anhydrous oxalic acid.

0.4186 Gm. substance required 21.4 Cc. of above potassium permanganate solution.

0.32545 Gm. substance required 16.7 Cc. of above potassium permanganate solution.

Calculated for $(C_{11}H_{14}N_2)_2.H_2C_2O_4$: 20.53 per cent. $H_2C_2O_4$; found: 20.10 and 20.17 per cent. $H_2C_2O_4$.

The results are slightly below those required by theory, owing, undoubtedly, to loss of some acid in the washing of the oxalate with acetone.

Abnormal Calycanthine Acid Oxalate, $3(C_{11}H_{14}N_2.H_2C_2O_4) + C_{11}H_{14}N_2 + 2\frac{1}{2}H_2O$.

2 Gm. calycanthine were dissolved in 30 Cc. acetone, and the solution mixed with a solution of two and a half grams of crystallized oxalic acid in 35 Cc. alcohol. The mixture was warmed till the solution became clear, and then set aside in a cool place. After 24 hours a considerable amount of snow-white needles crystallized out. The crystals were washed with a little acetone and dried in the air.

The abnormal acid oxalate is easily soluble in water, but difficultly soluble in alcohol or acetone. It begins to darken at 165° C., and melts with effervescence at 205° to 206° C.

0.35045 Gm. substance lost in desiccator over sulphuric acid 0.0147 Gm. H_2O.

0.3174 Gm. substance (anhydrous) required 22.2 Cc. of above potassium permanganate solution.

Calculated for $3(C_{11}H_{14}N_2.H_2C_2O_4) + C_{11}H_{14}N_2 + 2\frac{1}{2}H_2O$: 4.45 per cent. H_2O and 27.93 per cent. $H_2C_2O_4$ (for anhydrous salt). Found : 4.18 per cent. H_2O and 27.49 per cent. $H_2C_2O_4$ (for anhydrous salt).

Calycanthine Hydrochloride — Mercuric Chloride, $(C_{11}H_{14}N_2.HCl)_3.2HgCl_2 + 1\frac{1}{2}H_2O$.—With mercuric chloride, calycanthine seems to form different compounds under different conditions. The salt of the above composition was obtained as follows: 1 Gm. calycanthine was dissolved in 100 Cc. water acidulated with hydrochloric acid, and to the solution was added an aqueous solution containing three per cent. mercuric chloride till no more precipitate was formed. The liquid was then heated on the water-bath till it became perfectly clear and set aside. In about half an hour the liquid became turbid, and after standing 24 hours a white curdy precipitate separated out. The precipitate was washed with a little water, slightly acidulated with hydrochloric acid and dried in the air at about 25° C.

To the naked eye the mercury salt looks very much like the white precipitate (mercuric ammonium chloride, NH_2HgCl) of the pharmacopœias, but under the microscope the salt can be seen to consist of long acicular crystals.

The mercury salt is very difficultly soluble in cold water or cold alcohol, but quite soluble in these solvents when hot.

The salt contains one-and-a-half molecules of water of crystallization, which is given off in vacuum over dehydrating agents. Crystalline it melts at 184° C.; anhydrous it melts at 186° to 187° C.

0.1435 Gm. substance lost in vacuum over sulphuric acid and calcium oxide 0.0035 Gm. H_2O, and gave 0.0566 Gm. HgS.

0.20495 Gm. substance lost in vacuum over sulphuric acid and calcium oxide 0.00505 Gm. H_2O, and gave 0.0806 Gm. HgS.

0.2174 Gm. substance (anhydrous) gave 0.1889 Gm. AgCl.

Calculated for $(C_{11}H_{14}N_2.HCl)_3.2HgCl_2 + 1\frac{1}{2}H_2O$: 2.23 per cent. H_2O, 33.34 per cent. Hg, 21.13 per cent. Cl (for anhydrous salt). Found: 2.43 and 2.46 per cent. H_2O, 34.00 and 33.90 per cent. Hg, 21.49 per cent. Cl (for anhydrous salt).

The Hg is a trifle high, owing undoubtedly to some hydrochloride of the alkaloid carried down with the HgS.

The mercury salt cannot be recrystallized without undergoing a change in melting-point, amount of water of crystallization, mercury and chlorine.

Calycanthine Tartrates.—Attempts to make either a neutral or an acid tartrate of calycanthine were not successful. Both salts could of course be prepared by mixing molecular quantities of base and acid in presence of water, in which both tartrates are extremely easily soluble and evaporating the water completely. In this way the neutral tartrate can be obtained in solid condition.

The acid tartrate could only be obtained in the form of a semi-solid, very sticky mass. Attempts to obtain the tartrates in crystalline form were made as follows: On mixing a solution of 4 Gm. tartaric acid in 20 Cc. hot alcohol with a solution of 2 Gm. calycanthine in 10 Cc. alcohol containing a little acetic acid (to make the calycanthine more soluble) and warming the liquid, a clear solution was obtained from which, on cooling, a pasty mass of the acid tartrate separated out, adhering strongly to the bottom and the sides of the vessel.

An attempt to prepare a neutral tartrate of a definite composition was made as follows: 1 Gm. tartaric acid was dissolved in 10 Cc. alcohol and the solution poured into a warm solution of 3.5 Gm. calycanthine in 40 Cc. acetone. On gently warming the mixture a clear solution was obtained from which no solid substance separated out even after standing in a cool place for 48 hours. The liquid was then mixed with 50 Cc. ether, and the white, curdy precipitate formed upon the addition of the ether collected on a filter, washed with ether and dried in the air. The compound thus obtained was extremely easily soluble in water and had no definite melting-point, beginning to melt at 162° C., but not becoming liquid even at 200° C. As the lack of sharpness in the melting-point indicated indefiniteness of composition, an attempt was made to recrystallize the compound. It was dissolved in 40 Cc. hot alcohol and the liquid set aside. On cooling, the whole liquid solidified to such a stiff jelly that the vessel containing it could be inverted without anything flowing out. The jelly was then brought into solution by adding 40 Cc. more alcohol and warming the mixture. On cooling, the whole again solidified to a jelly. No further trials were made to make a tartrate in an analysable form.

Calycanthine Nitrosamine, $C_{11}H_{13}N_2.NO$.—Of the two nitrogen atoms in calycanthine one is secondary. This is shown by the fact that the alka-

loid combines with nitrous acid to form a nitrosamine. On mixing a solution of calycanthine hydrochloride with a solution of an alkaline nitrite no reaction can be noticed as long as there is no free acid in the solution, but the addition of hydrochloric acid to the liquid immediately precipitates the insoluble nitroso-compound.

3 Gm. calycanthine were dissolved in 100 Cc. dilute hydrochloric acid (5 per cent.), and to the solution was added a solution of 4 Gm. sodium nitrite in 50 Cc. water, and the liquid with the yellow precipitate set aside for about an hour and a half. The mixture should not be kept too long, as upon prolonged standing in contact with the mother-liquor, the yellow nitrosamine becomes green. The yellow precipitate was washed with water and dried on porous plates.

The nitrosamine thus obtained forms a yellow flocculent powder completely insoluble in water, and very little soluble in ether, benzol, alcohol or chloroform. It is easily soluble in warm phenol and slowly but completely soluble in cold pyridine. In hot pyridine it is extremely easily soluble. From its hot solution in pyridine the nitrosamine does not separate out on cooling, but addition of much water to the pyridine solution precipitates most of the nitrosamine in an amorphous condition.

The nitrosamine can be obtained in a crystalline form. For this purpose the amorphous nitrosamine is dissolved in five times its weight of warm pyridine and to the solution an amount of alcohol is added equal to twice the amount of pyridine used. Water is now slowly added to the liquid till a permanent turbidity appears, the liquid warmed till it again becomes clear, and then set aside in a cool place. After 48 hours a good crop of soft, short feathery needles of a dull yellow color crystallizes out. These were collected, washed with cold alcohol and dried in the air at about 25° C.

The crystalline nitrosamine becomes brown at 172° C. and melts at 175°–176° C. with effervescence. It gives Liebermann's nitroso reaction with great brilliancy.

0.1359 Gm. substance gave 0.3016 Gm. CO_2 and 0.0773 Gm. H_2O.

0.1880 Gm. substance gave 0.4112 Gm. CO_2 and 0.09765 Gm. H_2O.

0.2001 Gm. substance gave 36.8 Cc. N ($b = 749$, $t = 22°$).

Calculated for $C_{11}H_{13}(NO)N_2$; 60.02 per cent C; 6.46 per cent. H; 20.72 per cent. N. Found: 60.53 and 59.64 per cent. C; 6.38 and 5.82 per cent. H; 20.54 per cent. N.

While these figures are quite satisfactory, better ones yet could possibly be obtained by a second recrystallization of the nitrosamine.

Lack of material prevented repeated recrystallization.

From the mother-liquor of the crystalline nitrosamine a little more was obtained by adding more water. This second batch had a darker color than the crystals of the first batch and also had a lower melting-point, but on recrystallizing a second time from a mixture of pyridine, alcohol and

water, the second batch assumed the same color and had the same melting-point as the first batch.

When the nitrosamine, which is difficultly soluble in methyl alcohol, is covered with a mixture of one part of strong hydrochloric acid and two parts methyl alcohol it immediately goes into solution with a reddish color. The color changes slowly on standing, and quickly upon warming the liquid to a magnificent green. If the liquid be diluted with water before it becomes green the nitrosamine is reprecipitated. If the liquid be warmed on the water-bath for about fifteen minutes it still retains its green color, but can then be diluted with water without the separation of the nitrosamine; the addition of sodium carbonate to the liquid immediately precipitates a dark amorphous substance.

If the solution of the nitrosamine in the mixture of methyl alcohol and hydrochloric acid be kept for a longer time on the water-bath the green color disappears and a brown tint takes its place. If potassium hydrate be then added to the liquid, after diluting it largely with water, a brown crystalline precipitate separates out which will be investigated later.

Estimation of Methylimide in Calycanthine.—Calycanthine contains one CH_3 group linked to nitrogen. This was shown by Herzig and Meyer's method.*

0.1989 Gm. substance gave 0.2348 Gm. AgI.

Calculated for $(C_{10}H_{11}N)=N.CH_3$: 8.63 per cent. CH_3; Found: 7.56 per cent. CH_3.

The results obtained by this method generally vary according to the authors from +3 to—15 per cent. of total alkyl. Hence the results obtained are sufficiently accurate to prove the presence of an N-methyl group in calycanthine.

As a secondary base calycanthine ought to give alkyl and acyl derivatives. So far I have not been able to obtain an acetyl derivative by means of acetic anhydride or acetyl chloride or a benzoyl derivative by means of benzoyl chloride. The alkaloid is certainly changed by these reagents as no unchanged calycanthine could be recovered after treating it with acetic anhydride or benzoyl chloride. What compounds are produced by these reagents I shall try to establish later.

Methyl iodide converts calycanthine into a mixture of several compounds of which one is a quaternary base not precipitable by sodium carbonate. The exact nature of these compounds will form the subject of my next paper.

On digesting calycanthine with sulphuric acid the alkaloid seems to be converted into a sulphonic acid of which a barium salt was obtained. The analysis of the sulphonic acid and its salts will be reported upon later.

A new batch of Calycanthus glaucus seeds has been ordered and the work is to be continued.

Northwestern University School of Pharmacy.

* Ber. Dtsch. Chem. Ges. 27, page 319.

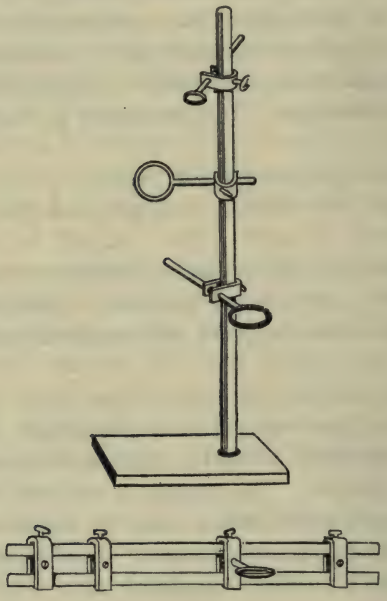
Mr. J. P. Remington, Jr., was then invited to exhibit and explain the working of his improved retort-stand for druggists' use, and he did so. The following is his paper on the subject:

PHARMACIST'S NEW RETORT-STAND.

J. P. REMINGTON, JR.

The common retort-stands used by pharmacists are not fully adapted to the needs of the drug-store or laboratory, because they are too frail to support the heavier glass vessels used in such operations as percolation, distillation, filtration, etc., and also because of their lack of adjustability, due to the construction of the clamps which connect the rings with the upright.

Some years ago the writer devised an apparatus stand for use in laboratory work, in which the clamps and rings were made in two separate parts,



so as to give greater play and permit the rings to be adjusted in any position that might be desired. This stand proved so useful to those who wanted something more substantial for their pharmaceutical laboratory work that a smaller stand adapted to drug-store uses possessing the same general features was desired. The stand here exhibited was therefore devised.

It consists of an upright made of ordinary gas-pipe, which can be cut to any length desired, and used either as an iron base or a flange to be secured to the counter. The use of the flange is generally preferred, as it

is possible to countersink several flanges in convenient places and screw the upright into any one of these sockets. By using an iron gas-pipe in place of the usual iron rod greater strength and cheapness for the same weight are secured.

The construction of the clamps is, however, the chief point of advantage possessed by the stand. They are shaped like the letter U, and provided with a thumb-screw and two holes, through which the shafts of the rings are to be inserted. In using the stand for operations it is simply necessary to place the clamp astride of the upright, pass the shaft of the ring through the holes in the clamp and turn up the thumb-screw so as to secure it tightly in place.

For operations which require a series of glass vessels to be used at the same time along a counter a slightly different adaptation of this idea has been used to advantage, as shown in the illustration. It consists in substituting two parallel gas-pipes running horizontally for the simple upright and by lengthening the ends of the clamp so as to catch both pipes. This permits the clamp to be pushed along either to right or left, so as to make room for other apparatus. This form is especially adapted to laboratory counters, or where only a little working space is available, as the parallel pipes stand out only four inches from the supporting wall, and when not in use are therefore out of the way and do not interfere with the working space.

The retort rings are made of malleable iron, to resist accidental breakage, and the stand is japanned to prevent rusting.

The writer had the parts here exhibited made by a Philadelphia concern.

The paper was referred for publication, on motion of Mr. Charles Caspari, Jr.

Mr. Rusby, at request of the Chair, came forward and proceeded to give a very interesting object-lesson upon the subject of drugs that are especially liable to substitution. He had a score or more of specimens of genuine drugs in bundles and bottles on the table in front of him, accompanied by specimens of the substitute article used in each case, and described and pointed out the differences between the genuine and the spurious. Among the drugs, with their substitutes, exhibited were the following: Honduras sarsaparilla, cinchona rubra and calisaya, pareira brava, saponaria, aconite, ipecac, bay leaves, capsicum, coto, hellebore, staphisagria, winters bark, quebracho, calamus, truxillo coca, veratrum viride, japorandi leaves, etc. Mr. Rusby said aconite was one thing not adulterated; that the only substitute he knew for it was Japanese aconite, and it was a question whether there was any difference. Some of these drugs were very scarce, the genuine article, notably japorandi and coto, and it was practically impossible to get them, and yet these substitute or spurious articles were almost all obtained in the drug-stores, and almost every one

was offered him for the genuine. The remedy for this pronounced and flagrant evil was exposure; exposure will stop any abuse if it is kept up. Ten years ago, however, in the New York market, things were five times as bad as now. But nothing could be worse than the present market for japorandi leaves. He had tried unsuccessfully for three or four months to get some of the genuine leaves for Mr. Lloyd. He saw a great opportunity for a fortune for the young man who would go to South America and engage in the cultivation of japorandi; it would be much safer than the much-vaunted rubber enterprises so widely advertised, and in which so many school teachers in a certain State had invested such a large amount of money.

Mr. Hallberg said he wanted to enter his emphatic protest against the loose methods that seemed to prevail in the customs service that would permit the importation of these spurious drugs for the genuine. It looked as though no progress of consequence had been made since 1852, when this Association was organized for the express purpose of putting a stop to this thing. He desired to offer a motion, if in order, that this Association protest most earnestly against this state of affairs, and that it be demanded of the Government that it adopt such methods as will make it practically impossible to bring any foreign drugs into this country without corresponding to the requirements of the Pharmacopœia.

The Chair suggested the presence of Mr. R. W. Moore, chief chemist of the Government at the port of New York, who had just arrived and would talk on this subject before the Section to-morrow morning.

Mr. Moore said that without going very far into the subject at this time, he could say that there was already an excellent law on this very point, and that the Government recognized certain Pharmacopœias and dispensatories as standards—the United States, English, French, German and Spanish. They make from seven to nine hundred analyses a year on imported drugs, and the matter is carefully watched in New York, but drugs are brought into the country at smaller ports, where they have neither the men nor the facilities for testing all kinds of drugs. Take the one item of asafetida alone, at the port of New York: Tests were made of it, and he had assayed it as low as 7 per cent. of resin, where the standard was 50 per cent., and a great deal of it had been rejected and kept out of the country. To the remark of Mr. Rusby that when he had to do with the importation of drugs they did not profess to be anything in particular, but where so many bales of drugs or so many bales of roots imported, Mr. Moore replied that the law was just that way now—not many drugs are mentioned by name in the law, and if a man brought in a root, and it was not just what it ought to be, he could simply say they were crude roots.

Mr. Eliel wanted to know what was to become of the pharmacist who had to depend on the botanical house for his drugs for making up the various preparations he has to make, under the conditions detailed. He

would simply have to analyze chemically and physically every drug under suspicion. He was in favor of some action along the lines proposed by the resolution of Mr. Hallberg, as it was the only thing he could see to secure protection to the pharmacist and those dependent on him.

Mr. Eccles wanted to know what was to be done with fluidextracts and tinctures that come into the country, and, under these circumstances, how the pharmacist could defend himself against the criticism of offering adulterated drugs.

The Chair suggested that the recommendation of the President in regard to the use of preservatives or antiseptics in foods or drugs, which was referred to this section, be referred to the same committee as that having the Chairman's address under consideration, as it covered the same ground. Mr. Bartley said he would like to see that go to a special committee appointed for the purpose, because it was a pretty broad subject. There were one or two papers on this line, and he thought it would be well to hear them first and then refer the whole subject to a special committee. No definite action was taken, however.

Mr. Eliel said that many of the members were anxious to attend an alumni meeting, and under all the circumstances he thought it would be well to adjourn.

Mr. Cohn so moved, and the Section stood adjourned to Thursday morning, at 9 o'clock.

SECOND SESSION—THURSDAY MORNING, SEPTEMBER 7, 1905.

The second session of the Section on Scientific Papers was called to order by Chairman Gane at 9 : 30 a. m.

The Chair stated that, without objection, the reading of the minutes of the first session would be dispensed with, and it was so ordered.

Further nominations for Chairman were called for, the Chair stating that the only nomination coming over from the first session was that of Mr. Charles E. Caspari. On motion of Mr. Wilbert, nominations were ordered closed, and the Chair directed to cast the ballot of the Section electing Mr. Caspari Chairman for the ensuing year. The Chair announced that the ballot had been cast as directed, and declared Mr. Caspari duly elected.

The Chair called for further nominations for Secretary, stating that the only nomination made at the first session was that of Mr. Daniel Base, of Baltimore. Mr. Wilbert moved that nominations be closed and that the Secretary cast the ballot of the Section electing Mr. Base. The Secretary announced that he had cast the ballot as directed, and the Chair declared Mr. Base duly elected Secretary for the ensuing year.

Mr. Puckner, Chairman of the Committee on Chairman's Address, made report for the committee as follows, first explaining that while the address contained a number of suggestions as to the best method of pursuing the

work of the Section, there were very few direct recommendations and the committee had acted only upon the latter.

REPORT OF COMMITTEE ON CHAIRMAN'S ADDRESS.

Your Committee on Chairman Gane's Address is, in a general way, in hearty accord with the many valuable suggestions contained therein. Acting on the direct recommendations:

1. We recommend that the Committee on Drug Market be made a standing committee of the Section and that they be entrusted with the duty of collecting data and reporting upon drug adulterations and drug market, and that the committee consist of a chairman and secretary and three experts: a pharmacologist, a chemist and a microscopist.

2. That the suggestion of the Chairman on the subject of fixing standards for unofficial drugs be referred to the Committee on the Report of the Delegates to the Section on Pharmacology of the American Medical Association and also the suggestion that this Section co-operate with the Council on Pharmacy and Chemistry A. M. A. in the investigation of all questions of pharmaceutical interest referred to the same committee.

Respectfully submitted,

W. A. PUCKNER,
E. H. BARTLEY,
LEO ELIEL.

Mr. Bartley explained that the committee had recommended a standing Committee on Drug Adulteration, consisting of two executive and three working members, each having his own field of labor, in the hope that by this division of labor the best results might be accomplished. The chairman of the Committee on Drug Market had suggested in his report that the General Secretary of the Association collect the data as to the adulteration of drugs and furnish to the committee, but this would be imposing a heavy burden on the Secretary, and he saw him shake his head when the suggestion was read, and the Committee on Chairman's Address thought if the Committee on Drug Adulteration were to make the report they should collect their own data, as any other committee would have to do, and the recommendation, if adopted, would make it their duty to do so. The idea is that once a year the Association shall have a report on what is going on in the adulteration of drugs and on the whole subject of the drug market.

On motion of Mr. Hallberg, seconded by Mr. Wilbert, the report of the committee was received and the recommendations adopted.

The Chair called for reports of other committees, but none was offered.

Incidental business was called for as the next order of business.

Mr. Mason said he would like to move that that portion of President Beal's address which referred to the use of preservatives, which was referred to this Section for consideration, be turned over to a special committee of three, to report back its recommendations at this morning's session.

Mr. Bartley moved to amend by substituting for a special committee of

three the Committee on Report of Delegates to American Medical Association, stating that the report just made recommend the reference of this matter, with several others, to that committee.

Mr. Wilbert opposed the substitute, because this subject was quite foreign to anything included in the report of delegates to the American Medical Association, and could not well come in the same connection.

Mr. Eccles reminded the members that if put in the hands of these delegates the matter could not come up this morning for action, and would have to be postponed for a year.

After some further discussion of the subject by Messrs. Mason, Bartley and Eccles as to the proper course of procedure, and after Mr. Eccles and Mr. Hallberg had "passed the compliments of the day," so to speak, on motion of Mr. Hallberg, as amended by Mr. Mason, it was decided to allow twenty minutes for discussion of this subject of preservatives, ten minutes to each side.

The Chair suggested that as Mr. Eccles had written a paper on the subject of food preservatives, which had been referred to this Section, it would be perhaps appropriate for him to lead off in the discussion by a presentation of his paper in abstract.

Thereupon Mr. Eccles, with characteristic vehemence and directness, proceeded to elaborate his theory, with the truth of which he was evidently deeply convicted, that the use of food preservatives within proper limits was not only not a detriment to the public health, but was a means of greatly decreasing the mortality from typhoid fever and other food-borne diseases in the States where such preservatives had been used for the ten years between 1890 and 1900. He presented a formidable array of comparative figures taken from the United States Census for those two periods to sustain his proposition—figures proving beyond question, in his judgment, that in those States, notably in the Middle West and Northwest, where the fight had waged bitterest against food preservatives, the tide of death from diseases of the character indicated had rolled highest. He graphically described the stupendous multiplication of the single bacterium to the inconceivable number of 165,500,000 in the short space of twenty-four hours, and portrayed the tremendous potentiality for disease and death thereby resulting. He derided the idea that water alone—even Philadelphia water—with its relatively small number of bacteria, could produce typhoid, but laid the responsibility on the enormous multiplication of the disease-germ in milk, meat and fish, resulting possibly from the mere casual contact of the foot of a fly bearing such a germ. Only in some such way as this could the typhoid germ, for instance, gain such force as to produce sufficient deadly toxin to injure the tissues before being overcome by the phagocytes of the blood. This was the explanation of how it was that thousands of soldiers in the Boer and Spanish-American Wars fell victims to this dread disease, and the scientific experts of both Great Britain and America so reported to their respective governments.

Recurring for a few moments to the Census returns, Mr. Eccles said that comparisons made by grand divisions of the country, comparing section with like section as to latitude and general conditions, showed that in the decade between 1890 and 1900 there was a very marked decrease in mortality in the urban districts as opposed to the rural, and this during the very period when food preservatives had their highest use in the cities of the land. He regarded the crusade now being made in many of the States against the use of such preservatives as a very grave mistake, and as the direct cause of the increase in those particular States of the mortality from typhoid and other food-borne diseases. He said further that, while it had not been accurately determined by bacteriologists as yet just what amount of food preservative was necessary to bring about the desired protection against disease germs, his personal opinion was that only a small amount was essential.

Mr. Hallberg took up the gauge of battle thrown down by Mr. Eccles. He invoked the shades of "Colonel Sellers," with his visions of three hundred millions of people in India with the sore eyes and his all-potent eye-water to cure them, at the saving power of Mr. Eccles' formaldehyde on the whole human family. He said he had been startled by an article in the daily press last January, announcing Mr. Eccles' great discovery (!), made from a comparison of the figures of the Census of 1900 with those of the decade before, that in those States where pure-food legislation had been enacted and rigidly enforced there had been a marked increase in the mortality from diseases of the digestive system. However, he utterly discredited the Census figures quoted as showing the true status of this matter, and said he had at once communicated with the secretaries of various State boards of Health in the central States, with the result that in many cases they reported there was no classification in their States of diseases of the digestive system. These reports also showed that there was no uniformity of classification, that the conditions were chaotic, and that it was next to impossible for anyone to make anything out of them. He did not have these reports with him, but he remembered the effect of the replies from Michigan and Minnesota, two of the States included in the district where Mr. Eccles had said these diseases were increased and the mortality made higher, and they absolutely refuted his position. Mr. Hallberg said he was interested in this question as a consumer, as a pharmacist and as a medical man, and he absolutely denied the correctness of Mr. Eccles' deductions drawn from reports "made for Census purposes."

Mr. Eccles' paper upon the subject of food preservatives here follows:

THE EFFECTS UPON THE COMMUNITY OF THE USE OF PRESERVATIVES IN FOODS AND BEVERAGES.

BY ROBERT G. ECCLES.

There are two theories extant regarding the ultimate effects of preservatives upon those who consume food containing these. One is that such

preservatives are poisons, and being such that, although they may, in the minute doses in which they are administered, show no immediate signs of poisoning that their continuous use must undermine the health and render the taker more susceptible to diseases of various kinds. Believers in this theory have asserted that preservatives when taken in food overload the kidneys, and bring on diseases of those organs. The only attempt that has been made to sustain this latter claim is a reference to the statement of some vague authority, whose name has nowhere been published, to the effect that there has been an increase in the death-rate from kidney diseases within recent years. Some anonymous persons, on the first of last April, telegraphed all over the United States that Dr. Hurty, as Secretary of the Indiana State Board of Health, had declared in a public meeting in Chicago that 455,000 infants were annually murdered by the adding of preservatives to their food. Pages of editorials were written in our leading daily and weekly papers, in which this claim was assumed to be true, and a most emphatic demand was made that the Senate of the United States give us a pure food law to put an end to such murder of the innocents. Before that press despatch went out, Mr. Paul Pierce, the leading popular advocate of pure food, and the man who most loudly denounced the Senate for not passing the Pure Food Bill, published practically the same statement under his own name. Dr. Hurty declares that he never said anything of the kind; that he was not in Chicago at the time he is charged with saying it, and that the whole affair was a pure fake made out of the whole cloth. There was not even a shadow of truth in it. Mr. Pierce has not replied to Dr. Hurty's denial. Mrs. M. D. Lincoln, the leading Washington advocate of "food reform," tells us that "epidemics of suicide and crime are increasing, no doubt stimulated by poisonous foods and drinks." She also informs us that perhaps "the only thing that will save the nation from ruin will be the millions of emigrants now invading America, who, hardened to crime and wretched conditions in prisons and Russia, have ironclad stomachs, and are immune against poison!" Miss Alice Lackey, representing the General Federation of Women's Clubs, publicly declared, in Philadelphia, that "various estimates have been given as to the exact amount of money spent each year for adulterated foods and drugs; according to recent statistics published, it ranged from $375,000,000 to $750,000,000, and a large percentage of this represents money paid out for supplies that contain rank poisons." Mr. Paul Pierce tells us that "not only is arsenic itself widely used as a food adulterant, but it has become a leading element in the new practice of adulterating other adulterants. Coal-tar dye, although previously regarded as a deadly poison, is made more effective as a preservative, and more poisonous by the insertion of arsenic." Writers in Mr. Pierce's journal, "What To Eat," have told us that the use of preservatives not only damages those who partake of them but that they actually injure generations yet unborn. Such sensational

claims are implicitly believed by many people. Even staid chemists, whose scientific training should have taught them better, have sagely assured the public that as preservatives can arrest the ferment of decay they must have the power of arresting digestion to some degree. This being the case, the more powerful a preservative is for saving food from decay the more dangerous it is. It was on this notion that our Department of Agriculture began its work. It was on this notion that our state dairy and food commissioners worked for years, and had multitudes of merchants fined and their property destroyed. It was for the purpose of proving this notion that a number of experiments were begun on men and animals. The theory that food preservatives are injurious is in every instance based upon old notions of our fathers that modern science has completely and effectually demolished, except where it is sustained on blank brazen falsehood. In order to get preservatives suppressed by law it became necessary to frighten the public by a most exaggerated showing of dangerous and fraudulent adulteration. Rare cases of such adulteration were made to appear as of daily and hourly occurrence. Not being able to inflate enough in the matter of food they find it necessary to include drugs. Here the same reckless disregard for truth is manifested with the same object in view, that of getting laws passed that will give an army of men a new chance at the public crib. The Secretary of the National Anti-Adulteration League was gravely reported by the New York press as making "the astounding assertion that of nearly two thousand druggists in New York city ninety per cent. not only adulterate their medicine, but use in defiance of law, "prescription adulterations," which, Mr. Thimme says, "are a menace to life." Prof. Ladd, of North Dakota, has been reported as saying that the druggists of that State could not be trusted to enforce a pure drug law. If the theory that preservatives in food are injurious to the public is a sound one, why are the facts that sustain it so few that the advocates have resorted to exaggeration and falsehood in order to sustain their contention? If it is true, why have they failed to show a single case of injury in twenty years of experience upon the population of the entire civilized world? If it is true, why are they unwilling to put the matter to the test experimentally? No one denies that the abuse of preservatives may do harm. The abuse of butter, sugar, pie, fruit, and even bread will do the same. The Washington experiments were not made on preserved foods. No experiments have ever been made on preserved foods, but upon excessive doses of preservatives. As well condemn the medicinal use of strychnine because in large doses it will sicken and kill. As well condemn the dietary use of butter because in large doses it will sicken and eventually kill. Abuse of butter is not use. Abuse of strychnine is not use. How silly it would be to punish a baker for using butter in a cake because it was experimentally shown that an excess of butter would damage the the taker. It would be equally silly to condemn a doctor for prescribing

strychnine in small doses because experiment had shown the danger of large doses. If this is a silly principle when applied to foods on one hand and poisons on the other, why is it not silly when applied to preservatives? Let us have experiments on two squads of men, one squad using food as ordinarily preserved in States where any kind of food not decayed can be sold, and the other on food that is known to contain nothing in the form of preservatives. Watch both sets for a year or two, and then report. If our Department of Agriculture will test preserved food in this way it will be doing a work that every person in the community could commend.

We come now to the second theory regarding preservatives. By the claims of this side preservatives in the amounts ordinarily used are not only harmless but actually beneficial. It is acknowledged that excessive use would injure, but it is held that before an injurious amount could be taken the user would become aware of his danger by the medical or physiological effects appearing. All of the common preservatives exist naturally in various kinds of foods and are being consumed in minute amounts regardless of man-made laws. In the way they are generally used they are far less injurious to the consumer than salt or sugar would be if used in amounts having the same preservative power. They are generally less injurious to the taker than would be a quantity of the food preserved containing a large medicinal dose of the preservative. This is certainly true of the organic preservatives. Any person could take with impunity a large medicinal dose of either benzoic acid, salicylic acid, or formaldehyde. I defy the same person to take at a single dose the amount of food or drink that his dose of the preservative would preserve in the amounts usually added. They are, as administered, less injurious than the food they keep would be to the same taker. The abusive dose of the preservative would injure less than the food it could preserve. These preservatives, as used, are therefore safer than any of the older preservatives and, in the sense here given, safer than the food. But why are they used? To keep down the development of germs. Can they do so? All authorities admit that they can. Diseases are due to certain kinds of germs. They can keep down the multiplication of disease germs. This is their greatest usefulness to man. Disease germs, according to the best authorities multiply, under favorable conditions, at the rate of about 165,500,000 from a single one in twenty-four hours. If one typhoid germ accidentally gets on meat or into milk at ordinary temperature it can become anywhere up to one hundred and sixty-five and a half millions in a single day. It is acknowledged that everybody can stand a fair dose of typhoid or other disease germs without catching the disease. One germ cannot produce enough deadly toxin to injure our tissues before it is killed by the phagocytes of our blood. Enough must be taken at once to damage our tissues or the diseases cannot start. One-tenth of a grain of morphine cannot poison us, but one grain might. One-tenth of a disease dose of typhoid

cannot harm us, but a full dose can. A piece of meat carried from Chicago frozen cannot develop germs. As long as it is frozen it is safe. The butcher exposes it on his counter to a fly. That fly has a typhoid germ or 100 typhoid germs on its feet and leaves some on the meat. You buy that meat and it is carelessly left by your servant where it is not cold enough. Perhaps the butcher had exposed it several hours on his counter. The typhoid germs that were few multiply into millions and when you eat that meat you are soon stricken with typhoid fever. It may have been milk that the fly infected and that milk was afterwards made into ice cream. In this way thousands have been killed. Our soldiers were killed by hundreds from food on which typhoid germs multiplied at the rate of 165,500,000 per twenty-four hours. The prisoners and soldiers of the Boer War perished by hundreds in the same manner. Epidemic after epidemic covering thousands of cases have been traced to this cause. Boards of health all over the world have been showing how milk has carried typhoid fever and how flies have been the go-betweens to carry the germs when they did not come in the water. It is silly to suppose that a few germs diffused in a glass of water could give a man typhoid fever. It is clear that when multiplied in milk, on meat, or on fish to many million fold, that that same glass of water could be guilty, by its merely being used to wash the vessels in which the milk, the meat, or the food were kept. This multiplication from one to hundreds of millions is not a matter to make light of, for it is killing our people by thousands. Other diseases like scarlet fever, dysentery, diphtheria, etc., have been proven to be food-borne. When the record comes to be fairly made up of what deaths are due to food it is easy to predict that it will be a most appalling one. A curious feature of the disease infection of food in that it occurs *before* putrefaction has fairly set in. The food does not taste putrid. Generally it is good enough to deceive an expert. There is absolutely no way yet known for detecting this death-dealing food. After putrefaction sets in we are safe, for no one is going to eat putrid food. Our only guide to safety is to either throw away all food that has been exposed to warmth for an hour or less or else be certain that it has had a preservative put upon and kept upon it during such exposure. If others have exposed it before you got it, then you must take your chances of disease and death till the time comes when laws can be made to compel them to put preservatives upon such food during exposure. But right here is the unsettled point in our contention. The exact amount of preservatives of various kinds required to keep down with certainty each kind of pathogenic germ has never been definitely settled. Personally I believe that the amount needed is small. All that we know of the nature of such germs and of the antiseptics used as preservatives indicate that the amount is small. The evidence, such as it is, is all in favor of this view. If we can but force interest toward this point our bacteriologists will go at the problem and settle it. If preservatives are to

be suppressed right or wrong, then there will be no interest in the settlement of this that is probably the most momentous question of our century. If the amount needed is small, then there can be no questioning of the conclusion that their use will save millions of precious human lives and save years of incalculable agony and anguish. Food can be preserved from putrifying bacteria with small amounts of preservatives. As to whether these amounts are of any value in protecting health and life from the germs of disease let us try and discover by an appeal to statistics. There are two ways of testing the problem with the hope of a fair degree of success in getting a reply. First we have the effect of time on any large community. If we discover that in food-borne diseases the death-rate has been increasing or nearly stationary for a period of say ten years during which preservatives are known to have been used in ever-increasing amounts, then we have an indication that they are either injurious or of no benefit. If, on the contrary, we find that during such a time the death-rate has been lowered, we have, to say the very least, a strong intimation that they may be beneficial. Theoretically, by their keeping down the numbers of disease germs many million fold, we should expect the figures to show such a decrease. On page cxiii, part I, of the Vital Statistics of the United States, we find table A of General Diseases. This gives the death-rate, for the entire Registration Record of the United States, per 100,000 of population, for 1890 and 1900. Selecting from this table all the diseases that are known to have been food-borne we get the following instructive figures :

DEATH-RATE FROM EACH DISEASE.

Causes.	1890	1900	Decrease.	Increase.
Scarlet Fever	13.6	11.5	2.1	
Diphtheria	70.1	35.4	34.7	
Typhoid Fever	46.3	33.8	12.5	
Cholera Morbus	4.5	6.2	—	1.7
Dysentery	32.3	13.6	18.7	
Diarrhœa	27.2	12.8	14.4	
Enteritis	40.1	52.5	—	12.4
Cholera Infantum	79.7	47.8	31.9	

With two exceptions every food-borne disease on the list shows a very decided decrease and the exceptions happen to be those of diseases that over 50 per cent. of the doctors of the country would confuse with cholera infantum or dysentery according as it was infants or adults that were attacked. Practically, therefore, the entire table shows no evidence of anything but decline in deaths for every food-borne disease. On page cxvi the government statistician says concerning the whole table : "There was a great decrease in the death-rate due to these diseases between 1890 and 1900, amounting in the aggregate to 74.5 per 100,000 of population. *The*

decrease was greatest in the cities (113.7)." (The italics are mine.) On what possible theory can we account for so general a decrease as 74.5 per 100,000 for the entire registration regions of the United States, and of 113.7 for the cities, during the ten years that the use of preservatives in food was at its worst? Why was this decline so much greater in the cities than in country places? Country people have the freshly produced products of their own farms. They do not feel the necessity of keeping food long enough to endanger it of becoming putrid. The farmer is not likely to be eating borated hams, borated milk, formaldehyded milk, borated cream, salicylated jam, benzoated preserves, sulphited Hamburg steaks, nor is he prone to drink salicylated beer. His eggs and poultry are fresh and do not need to be brought to him in preservatives. Can you imagine how there can happen to be no connection between these facts and the official figures? Where the most preservatives were used the decline in death-rate between 1890 and 1900 was the greatest and very markedly the greatest.

The second test of the theory is the space test. The statement of the statistician has given us the cue to a means of learning our lesson from it and at the same time getting a new piece of evidence of our surmise about the meaning of the difference between city and country rates. Will the space distribution confirm the conclusion we draw from the time distribution? Are the variations in death-rates distributed over the country in accordance with the distribution of the use of preservatives? We have found that the time distributions are in strict accordance with such distribution. Most known zymotic diseases have a natural tendency to spread by contact. Scarlet fever is a marked example of this type. Anything that tends to crowd people into close, stuffy houses tends to increase the number of cases and thereby the death-rate. Winter crowding therefore makes this disease increase in cold weather and increase where it appears in school regions. After a region has been visited once it tends to lower its own rates in that region. These complications would therefore make it difficult to trace clearly the effect of food on this disease although it can be done. With typhoid fever the complications are less pronounced. Contact only carries it exceptionally and so crowding has but little influence on its spread. The two chief causes of its spread are known to be water and flies. The proof in both is absolute. No one can study the facts and doubt them. As both of these media are affected by cold weather and the spreading hindered by such weather, it is evident that, other things being equal, warm regions should show a tendency toward higher rates than cold regions. Statistics confirm this inference. If we wish to discover the effect upon typhoid fever of the use of food containing preservatives, providing any such effect exists, we must compare northern regions and their short summers with other northern regions having equally short summers, and southern regions with southern. On page

cxlvii, part I, Vital Statistics, we find the following table "showing for each grand group in the United States, the proportions of deaths from typhoid fever during the census year, per 1,000 from known causes, in the aggregate, and by sex, for the cities and rural districts:"

NUMBER OF DEATHS PER 1,000 DEATHS FROM KNOWN CAUSES.

	Total.	Males.	Females.	Males.	Females.
1 North Atlantic Coast region	12.6	14.2	9.2	15.3	10.6
2 Middle Atlantic Coast region	14.2	25.8	24.9	12.4	10.5
3 South Atlantic Coast region	41.8	51.3	47.7	25.9	20 3
4 Gulf Coast region	45.2	58.4	54.8	21 6	25.9
5 Northeastern hills and plateaus	18.1	19.7	16.4	20.4	15.7
6 Central Appalachian region	23.7	27.3	24.1	21.9	16.4
7 Region of the Great Northern Lakes	19.7	20.6	21.5	20.2	17.7
8 Interior plateau	34.4	41.4	39.4	32.2	25.5
9 Southern Central Appalachian region	63.3	66.3	62.6	44.5	38.7
10 Ohio River belt	43.6	52.6	55.1	30.0	28.6
11 Southern Interior plateau	76.1	74.0	78.1	—	—
12 South Mississippi River belt	47.0	50.7	54.2	26.3	19.2
13 North Mississippi River belt	33.3	39.6	42.7	25.2	23.0
14 Southwest Central region	69.5	68.4	72.8	38.1	39.3
15 Central region—plains and prairies	52.1	55.5	56.5	37.1	29.2
16 Prairie region	35.7	35.4	36.4	33.2	33.7
17 Missouri River belt	37.9	43.8	44.2	31.1	25.3
18 Region of the Western plains	43.4	50.1	45.3	28.3	28.5
19 Heavily timbered region of Northwest	23.8	23.7	18.2	36.1	26.0
20 Cordilleran region	31.8	30.4	37.1	27.6	20.0
21 Pacific Coast region	24.1	20.0	33.5	23.2	17.4

Now let us examine this table and see what it tells. Taking group 15, in which the farming population is greatly in excess of the city population, and comparing it with grand group 1, in which the city population is more than two-thirds of the total, we get the following startling results:

		Rural.		Cities.	
Both Northern.	Total.	Males.	Females.	Males.	Females.
Group 15; chiefly farmers	52.1	55.5	56.5	37.1	29.2
Group 1; chiefly city people	12.6	14.2	9.2	15.3	10.6
Excess death-rate of farmers	39.5	41.3	47.3	21.8	18.6

Next taking groups two and six, both of which are northern, we discover that the difference in the relative proportions of their city and country population is much less than in groups one and fifteen. Strange to say this difference is exactly reflected in the difference in death-rates. The following figures show the condition:

		Rural.		Cities.	
Both Northern.	Total.	Males.	Females.	Males.	Females.
Group 16; chiefly farmers.....	35.7	35.4	36.4	33.2	33.7
Group 2; chiefly city people.....	14.2	25.8	24.9	12.4	10.5
Excess death-rate of farmers	21.5	19.6	11.5	20.8	23.1

If we next compare the northeastern hills and plateaus of New England, including the Adirondacks, with the Missouri River belt we get a contrast of two regions in which the farming population is in excess in both, but with the difference that the proportion of city people to country people is considerably larger in the first named:

		Rural.		Cities.	
Both Northern.	Total.	Males.	Females.	Males.	Females.
Group 17; farmer excess largest ..	37.9	43.8	44.2	31.1	25.3
Group 5; farmer excess smallest ..	18.1	19.7	16.4	20.4	15.7
Excess death-rate for farmers.....	19.8	24.1	37.8	10.7	19.6

In none of the southern regions does the city population exceed the country population. They are all rural, but in some the proportions of city people are greater than in others. In grand group 3 the city population is about 12 per cent. of the total, while in grand group 14 the city population is less than 2 per cent. of the total. As a result of the 10 per cent. preponderance, small as this difference is, we get the following figures:

		Rural.		Cities.	
Both Southern.	Total.	Males.	Females.	Males.	Females.
Group 14; farmer excess largest ..	69.5	68.4	72.8	38.1	39.3
Group 3; farmer excess smallest ..	41.8	51.3	47.7	25.9	20.3
Excess death-rate of farmers	27.7	17.1	25.1	12.2	19.0

Although the Gulf Coast region is farthest south and would necessarily tend to a higher death-rate than regions north of it, we find that the southern interior plateau exceeds it in deaths of its rural population. In this group, however (11), we are informed by the statistician, the temperature is higher than in group 4, has a more humid atmosphere, and its population is practically all rural. This combination of heat, humidity and farmers has furnished the following figures:

		Rural.	
Both Southern.	Total.	Males.	Females.
Group 11; nearly all rural	76.1	74.0	78.1
Group 4; 20 per cent. urban	45.2	58.4	64.8
Excess death-rate of rural.....	30.9	15.6	13.3

If we now turn to the far west and compare the Cordilleran, or Rocky Mountain region, with the Pacific Coast region, we find the same condi-

tion of things as in the northern and southern regions. In the Pacific Coast region nearly 50 per cent. of the population is city people, while in the mountain region only about 10 per cent. are in the cities. This kind of distribution furnishes us with the following results:

		Rural.		Cities.	
Both Western.	Total.	Males.	Females.	Males.	Females.
Group 20; about 90 per cent. rural..	31.8	30.4	37.1	27.6	20.0
Group 21; about 50 per cent. rural..	24.1	26.0	33.5	23.2	17.4
Excess death-rate for farmers.....	7.7	4.4	3.6	4.4	2.6

We have but to consider the fact that much of the rural population of the Cordilleran region is miners instead of farmers to see why the excess of rural deaths is not as large as in the other cases. Miners do not get home-produced preservative-free foods. The perfect coincidence of each and every phase of these statistics, in time, in place, and in quantities with the known facts of the distribution in the use of preservatives is astounding if it is not causal. In fact it would seem to be miraculous in its minuteness of parallellism if merely coincidental. What other conceivable explanation can be advanced? No other has yet been proposed. This one covers the facts exactly, and therefore deserves the most candid and careful attention of every capable person interested in human welfare. If it is not the true explanation, a better one should be forthcoming. If it is the true explanation, its neglect is positively criminal. Whoever has been reading the papers of late must have been struck with the fact that cases of typhoid have been increasing of late. Coincident with the raids on preserved foods come reports of this rising tide of disease and death. Strange too is the fact that these reports are coming from the very states in which the so-called pure food raids are being made. Stranger still is the fact that no such reports are coming from regions remote from such raids. In the city of Philadelphia the typhoid cases were 444 in 1901, 588 in 1902, and 957 in 1903. The rise steadily keeps pace with Dr. Warren's efforts, and it shows no jumps to indicate any sudden defect in the water supply. The Report of the Department of Health for 1903 shows on maps the evidence of two epidemics in that city from milk. Here is a press despatch of July 12, 1905, that appeared in the New York papers, as coming from Michigan, another State where pure food raids have been common lately: "Five hundred students and their friends partook of a commencement banquet at Alma College two weeks ago. To-day nearly two-score of the guests are dangerously ill of typhoid fever. Several of the patients reside in this city or its vicinity (Alma). The remainder are scattered over several States. It is believed by the medical authorities of the college that the ice-cream served at the banquet was polluted with the deadly germs." All that was needed for such a tragedy was a few germs in the milk from polluted water or from a fly. Time

would do the rest by multiplying each germ into millions within a single day.

Mr. Lowe regretted that lack of time prevented further discussion of this subject, and expressed the opinion that the "golden mean" lay between the extreme views presented by the gentleman who had just spoken.

Mr. Kebler moved to refer the whole matter to the Committee of Delegates from this Section to the Section on Pharmacology of the American Medical Association, to coöperate with them in trying to reach a proper conclusion.

Mr. Beringer moved as a substitute that the question be referred to a special committee of five, to be appointed by the Chair. He did not think it was in the proper province of the Committee of Delegates to the Section on Pharmacology of the American Medical Association to consider this subject. This motion was seconded by Mr. Hallberg and carried, and the Chair stated that the committee would be named later.

The report of the Committee on U. S. Pharmacopœia was called for, and Mr. Hallberg, of the committee, explained that Chairman Lyons was detained at home by illness in his family. Mr. Hallberg had the report, which he said was quite voluminous, and had been passed around to most of the members. After explaining how the committee was constituted, and its intention to make annual reports recommending desirable changes in the Pharmacopœia, so that when the decennial convention meets the Association will be thoroughly advised, Mr. Hallberg stated that the chairman had gone more or less into detailed criticism of the principal features of the new Pharmacopœia, but the committee did not think it was practical at this time, or would be desirable, to go into a discussion of these changes, as most of the members were not sufficiently familiar with the new Pharmacopœia to warrant such a discussion. The committee therefore begged to present the report for reference to the Publication Committee, and then it could be arranged with the chairman and the other members of the committee as to the disposition of the report eventually.

Mr. Beringer opposed this suggestion, and stated it as his opinion that there was nothing more important than a discussion of the Pharmacopœia, and he thought there were a number of items in the report which might be profitably discussed at this time. He suggested that Mr. Hallberg read from the report certain features for discussion.

Mr. Hallberg thought this would take too much time, but Secretary Caspari reminded him that an hour had been set apart at the first session for discussion of the Pharmacopœia at this session.

Mr. Hallberg then said he would first read the preface, which was of general interest, and then take up some of the points of special interest that had been marked in the report. Thereupon, he proceeded to read the preface until he got down to "Aconite," where he stopped to call attention to the change in strength established by the new Pharmacopœia,

and suggested that the change in strength of galenicals be taken up for discussion.

Mr. Beringer said he thought the purpose of carrying out the idea of 10 and 20 per cent. strengths in the tinctures and wines was a good one, but it had led to a number of inconsistencies, which he proceeded to point out. As aconite and other tinctures were liable to cause trouble on account of the change in strength, he had adopted the plan of sending out circular letters to his physicians, asking them to specify in every prescription whether they wanted the 1890 or the 1900 Pharmacopœia to apply, as, in the absence of such specification, the new Pharmacopœia would govern at his store. Mr. Beringer went on at some length to discuss other difficulties likely to present themselves to the practical pharmacist in working with the new Pharmacopœia, and his ideas for meeting those difficulties.

Mr. Lowe said that he, too, had sent out notices to his physicians that on and after September 1st, unless otherwise specified, the new Pharmacopœia would be followed in the matter of preparations, but that the old preparations would be kept in stock and could be had if desired. He was sorry the new Pharmacopœia had gone into effect so soon after notice; he thought the 1st of January would have been a better date, especially as many new pharmacists would not have the book before that time.

Mr. Hynson did not anticipate the trouble that some of the members seemed to fear. He thought the exercise of good, sound common-sense would solve most of the difficulties. He did *not* think any sensible pharmacist would fill a prescription using a 35 per cent. tincture of aconite, for instance, where a 10 per cent. tincture was evidently intended.

Mr. Eliel said it had been an easy matter for him to look over the pages where the changes in the strength of tinctures and other preparations had been so lucidly stated, and send out notices to the physicians of his city calling their attention to the changes made,—especially to such changes as that in the strength of aconite,—and ask them if they still desired to use the strength of the Pharmacopœia of 1890 to so specify in their prescriptions, as otherwise all preparations and tinctures dispensed would, after the 1st of September, comply with the requirements of the new Pharmacopœia. In connection with the change in the strength of aconite, he expressed the fear that very little tincture of aconite would be used hereafter by the physicians; they would use the fluid extract, which would be rather unfortunate for those who depended upon their own laboratories for the preparation of tinctures. Mr. Eliel was inclined to sharply criticise the omission from the Pharmacopœia of 1900 of all reference to the work done by the Committee of the American Pharmaceutical Association on Revision of the Pharmacopœia. He could not understand why this committee, consisting of some of the ablest workers in the Association, should be ignored in this manner, and he thought an injustice had been done and that an explanation was due.

Mr. Martin, of England, agreed with Mr. Hallberg that the Pharmacopœia had not been long enough in the hands of the pharmacists to enable them to criticise it fairly and intelligently. Through the kindness of the Revision Committee, he had been favored with an early copy, but that only came on the eve of his departure from England, and the only opportunity he had had to look at it was while crossing the ocean. He had heard nothing, however, but a chorus of praise for it, in which he joined most heartily; but if at any time in the future he should find it to be not so perfect as desired, and he should be heard singing a solo out of harmony with this chorus, he hoped it would be attributed to his love of pharmacy being greater than his love of dollars or popularity.

Referring to the question of standardization, Mr. Martin reminded the members of the disposition to refer everything to chemistry, and pointed out that a knowledge of the therapeutic value of many drugs antedated chemistry, and that the chemical test was not in all cases the measure of the therapeutic effect of the drug. He had not had experience in the volumetric estimation of alkaloids, but was inclined to view with suspicion the estimation of organic matter which depended on delicate color-reactions.

He said he had heard a great deal yesterday, in the Educational Section about higher education in pharmacy, and about pharmacy being a profession, with all of which he agreed, and maintained that pharmacy was a co-ordinate profession to medicine; but how could it be a profession unless the pharmacist himself could identify every drug, from start to finish, that he handled? In the Pharmacopœia there is a considerable number of fluidextracts of one strength—about one-fourth of the whole of the pharmaceutical preparations; but many of these preparations are not, and cannot be, made in the average pharmacy, and the pharmacist is therefore compelled to take Smith's and Jones' makes. This evil of specification is to be regretted, and according to the extent the Pharmacopœia lends itself, or can be lent, to practices of that sort, it tends to that extent to sound the death-knell of pharmacy as a profession. (Applause.) If pharmacy is to be a profession, it must be based on the intimate knowledge of its individual members, and that knowledge, combined with character, must impress the physician.

Mr. Martin regretted the paucity of preparations in both the American and British Pharmacopœias. They go on conservative lines, and do not provide more than a half or a fourth as many preparations as the intelligent physician's needs require.

Mr. Hallberg said there were four more features of the report to be presented, and it would not do to consume too much time on any one of them. There yet remained the subjects of method of testing, alkaloidal assay process, nomenclature, and medical attitude.

Mr. Ebert protested against further attempt at detailed criticism at this

time, and insisted that the discussion should be upon the book as a whole —to allow the members to state their general impressions, as Mr. Martin had done. This plan would give everybody a chance to hear and be heard. Personally, he did not want to speak, but he would be glad to hear others on this line.

The chair explained that this was the original idea, but the Section had voted to consider the report section by section. Of course, it could reconsider this action, in which event he thought it would be highly appropriate for Mr. Joseph P. Remington, Chairman of the Committee of Revision, to introduce the discussion.

No objection was made to this suggestion, and Mr. Remington was invited to take the floor, and said :

Mr. Chairman : Some of my friends told me there was a large number of tomahawks, stilletos and razors sharpened, and they wanted me here to-day, so I came. (Laughter.) However, I do not think there will be anything very serious, because we have had the verdict of the country on the new Pharmacopœia, and especially that of the experts outside of the Committee; and I think we can say that on the whole, it is favorable, and that it is as much as we can expect.

There is a way provided for taking care of criticisms on the Pharmacopœia, and I want to say that my distinguished predecessor, Dr. Charles Rice, ten or twelve years ago started what was called a digest of criticisms. There were all sorts of criticisms of the Pharmacopœia, and he employed a man to compile all that found their way into print, and three books have been published of the criticism of the Pharmacopœia. Most all of you know about this; they were sent broadcast over the country, and you could get them for the price of the postage. The idea was certainly a most excellent one, and the number of inquiries that have come from abroad for copies of this digest would surprise you. The idea originated with Dr. Rice, and it is the intention of this committee to continue to collect criticisms.

Now, I think I must agree in the main with the remarks of my friend Ebert in regard to this discussion to-day. You can go on and discuss the question of the Pharmacopœia everyday from now to next Christmas, and you would not get through. Your time is limited, and it would save time and be much better in every way to have a general discussion, and it may save me from the onslought of these gentlemen who are here with their tomahawks and revolvers.

Of course the fact must be recognized that criticisms are important, and not a single member of the committee will shirk the responsibility which has been placed upon him. It is a difficult thing to gather from all over the United States a consensus of opinion.

Now, the contents of this book (and by the way, that is, the new flexible binding) does not represent what I wanted, and it probably does not represent on the whole everything that any one member of the committee wanted. It represented what we could get, or what we could do as a committee; for it reflects no one man's individual opinion. Every matter of detail in this book was carefully considered, even the preface went to every member of the committee, who voted on it, and marked it yea or nay, and of course the majority ruled. Consequently I say it does not represent all I wanted, or that Mr. Hallberg wanted, or that Mr. Ebert, or Mr. Beringer, or any other man here wants; it represents the combined ability of the committee, with the digest of criticisms before them, and with the suggestions of the American Pharmaceutical Association and those of every State Association before them. And truly, gentlemen, I can say that you have a committee you can well feel proud of. I am sure they worked hard; they have done magnifi-

cent work, and every criticism that could possibly be brought before them was heard. But when you have possibly a hundred and fifty suggestions or criticisms on a large question like opium, for instance, somebody has to decide—something has to go into the book; you can't shirk the responsibility. And therefore you must take the consensus of opinion, and arrive at the best possible judgment. Now, I do not believe any body of men—even such a body of men as we see here, and there is represented here to-day the best and the flower of American pharmacy—would be competent, in a short time that this book has been in your hands, to discuss it in detail and arrive at as correct a conclusion as this committee has, after studying these questions for four years. This is not said to forestall criticism; we expect it, we want it. We are going to have research committees, and we are going to start on our next revision soon after this book is on the market, because we want the best pharmacopœia in the world, and we want criticism.

Now, I will take a few moments to reply to one or two criticisms: Let us take tincture of iodine. This process is a great improvement. Potassium iodide is added with the object of preserving the iodine content. Professor Coblentz made a number of exhaustive investigations on this subject. He had kept on hand for six months some tincture of iodine containing a small amount of potassium iodide, and the amount of iodine at the end of that time remained practically constant, and simple tincture of iodine will not compare with it. It makes the preparation more stable, and prosecutions in the future will be fewer. Another criticism about the new tincture of iodine is, that when applied to the skin, owing to the small quantity of potassium iodide present, there will be a little precipitation of crystals and consequent irritation of the skin. I have had it on my hand, and did not find that this was the case. But it will stop prosecution, and the pharmacist will not be liable to arrest or fine. Apropos to this, I received a letter yesterday from a gentleman in Illinois, who has been prosecuted because under the old Pharmacopœia of 1890 it was found that the iodine on his shelves was slightly deficient in strength.

Now in regard to veratrum viride? You need not feel any concern about this subject. The Pharmacopœia, under the general head of *veratrum*, has recognized both species, *viride* and *album*. The Pharmacopœia committee were advised that investigation had shown that veratrum album possesses properties equivalent to those of veratrum viride. But, as the text of the Pharmacopœia stands, it does not prevent you from making your preparations from veratrum viride.

Mr. Lowe said he thought the date of going into effect of the new Pharmacopœia should have been put at January 1, 1906. I would remind you that a long, weary road had been travelled. Gentlemen, there had been four or five years of work; the country was growing impatient, and the Board of Trustees passed a resolution that the date should be fixed at 90 days after the book was issued. But we were delayed at the last, and we had to knock off a month, and the time was set for September 1st. But I really believe, with the wide publication given the matter through the medical journals, together with all the explanatory notices of changes made in the Pharmacopœia as to tinctures and so on, that every doctor in the country had ample notice. As a matter of fact, no matter what notice had been given whether two years, or two months, or two weeks, some laggards would have been found who had paid no attention to it.

It seems hardly necessary for me to assure this Association that it was furthest from the intention of the committee to ignore the American Pharmaceutical Association's reports in this matter of revision. It would have been impossible for us to print in detail the names of all those who had helped us in this work. I suppose I am to blame for this particular failure, and the best thing I can suggest is, that in the preface of the next issue I will see that the American Pharmaceutical Association is given credit for its work. It was entirely unintentional, and I suppose the impression on my mind was, that the Pharmacopœia is very largely the child of the American Pharmaceutical Association, and it would seem like acknowledging work done by ourselves. You will find nothing in that

preface which acknowledges the work done by individual members of the committee, and they did the hardest work. We didn't want to acknowledge work done by ourselves; the book speaks for the work of the committee, and the names of the committee are there.

Now, in regard to the National Formulary and other formularies. One of the greatest difficulties—and, I may say, the great problem—in pharmacopœial revision is to determine what is to go into the Pharmacopœia and what is not to go into it. It is the hardest problem we had to settle; and when I tell you that Dr. Rice struggled with this problem from the very beginning, in May, 1900, for a year, and when he died the question was still unsettled—you will understand what it means. Every pharmacist knows what a worker he was, and every one knows his ability, coupled with his experience on two revisions. It is impossible to ever settle questions satisfactorily on expurgations. One man thinks that one drug or preparation must go in the Pharmacopœia, while another wants to know why such a useless thing should be there. We can only try to ascertain the consensus of opinion, and take all the books and make the best judgment we can under the circumstances. Some men will say, "I don't use that." But you must remember that this is the Pharmacopœia of the United States of America, and therefore if a preparation is not used in your locality it is used in some other, and the selection of the things to go in and the things to leave out, was made after years of hard work. There is no prejudice and influence about it. Everybody gives his opinion, and the subject is discussed and fought over for a year before it is settled; and I believe in the main, for the whole United States, the final report will be satisfactory.

Now, as to the insertion of more preparations: I wish we could have had in the Pharmacopœia more preparations. But in what direction were we to go? Here were the manufacturers with their price-lists, and we must take into account the retail druggist, for he is the man that uses the Pharmacopœia more than any other man many times over. He says, "What do I want with this in the Pharmacopœia? I have the lists of the manufacturers, and I don't need them in here—all these pills and powders, and so on." What is the use of putting them in the Pharmacopœia? The book would have been three times as large. We want in the Pharmacopœia the preparations that can be used and made by the pharmacist. After all, the Pharmacopœia is primarily a book of standards. And it is more of an object to fix a standard than to have a formula for every kind of pharmaceutical preparation. That may be a question of judgment again, but so it goes. Nine out of ten criticisms are but a question of individual preference. For instance, one man in Philadelphia said, "Why do you use oil of peppermint in that preparation? For forty years I have used oil of spearmint, for it is preferable, and agreed infinitely better with the stomach." I said, "This is a National Pharmacopœia, and, taking it over the United States I believe peppermint is more largely preferred, although you may prefer spearmint." And so it goes. Take the digests of criticisms prepared by Dr. Rice, the subcommittees that went over them usually found that nine out of ten were criticisms of that kind—I prefer this, or I prefer that.

If there is anything that anybody wants further information about, I would suggest that I am not the only member of the committee present; there are other men here that can speak for themselves. But in closing I want to say that never before has any Committee of Revision had such a serious time or worked under such tremendous disadvantages as has this committee. Seven of our most valuable workers passed away. Every time a reorganization was necessary; and the work has been carried on under great pressure, particularly during the last two years. It is hard to work where men are sticking pins in you and asking why the book is not out. It is a great satisfaction, I can assure you, when the book is finally out, to find it generally satisfactory. But we welcome criticisms, and true pharmacists will tender them in a spirit of helpfulness, and every member of the committee will do what he can to make the book as perfect as possible, and we

sincerely trust it will commend itself to your good judgment. (Great and continued applause.)

The chair stated that the time allotted for the discussion of the Pharmacopœia had more than expired, and the regular order of business would be proceeded with.

Thereupon Mr. Beringer, in view of the fact that the report of the Committee on U. S. P. contained quite a number of suggestions in regard to the work before them, moved that in receiving the report and referring for publication, as suggested by Mr. Hallberg, that the chairman be requested in future to have his committee organized into sub-committees, to which should be referred the various subjects for investigation. This motion was adopted.

The following is the full text of the report of the Committee on United States Pharmacopœia :

REPORT OF COMMITTEE ON THE U. S. PHARMACOPŒIA.

The first report of your Committee must in the nature of things be of a preliminary character. The Pharmacopœia of 1900 has but just made its appearance. There has not been time for any systematic, critical study of it by your Committee as a whole. The chairman of the Committee has received from a few of the individual members some "first impressions," which coincide in the main with comments in the pharmaceutical press. Some of these it may be profitable to discuss in this preliminary report. No human work is so perfect that it is not possible to suggest improvement.

Necessarily criticism of the work of those who have stood as our own representatives in carrying out so important an undertaking as the reconstructing of our Book of Standards must be friendly. We must expect to find inequality in the work, since it is a revision, not an original work. To write a new book is a far easier task than to revise an old one. When twenty-five men, scattered all over the United States, collaborate in such a task, it must be expected that the result will show some measure of lack of balance, in spite of all the vigilance of the able editor of the work.

No change should be made in the physician's book of standards without good and sufficient reason. The Revision Committee have realized this fully, and yet certain changes that they have made will seem to the outsider unjustifiable in absence of any explanation. A statement of the reasons would generally satisfy the public of the wisdom of the change, and it seems very desirable that in future such a statement should be made in the Preface to the Pharmacopœia. An instance: Among articles dismissed from the Pharmacopœia we find vinum colchici radicis. The preparation is one frequently prescribed by physicians. Why should it be dropped? The reason is a good one, provided it is given publicity—not otherwise. It is to carry out consistently the principle that all "wines" and "vinegars," as well as "tinctures," of potent drugs are henceforth to be of a uniform strength of ten per cent. The wine of colchicum seed has been brought to this strength. It was not deemed wise to confuse physicians unnecessarily by offering a wine of colchicum corn of the same strength, or to give occasion for "accidents" from the dispensing of the old forty-per-cent. wine of colchicum root in place of a ten-per-cent. wine. If the article were simply dropped, the old preparation would be adopted by the National Formulary, and would continue to be prescribed and used for a few decades without Pharmacopœial authority.

The reason, it must be admitted, loses force in view of the introduction into the offi-

cial list of a wine of coca representing only 6½ per cent. of the drug, and so conflicting with the desirable principle of uniformity in the percentage strength of galenical preparations from vegetable drugs.

In this connection we must express regret at the action by which the strength of the tinctures of aconite root and of veratrum viride was made "uniform" with that of other tinctures of potent drugs. Serious accidents must inevitably occur from these changes, since every pharmacist will be obliged to keep in stock both the old and the new tinctures, and it will be impossible for him always to be sure which one the physician intended to prescribe; he might even remain in doubt after consulting with the prescriber. It is too late now to discuss the alternatives that might have been considered. We are committed to an official tincture, so different from that to which physicians have become accustomed, and which the majority of them will continue to use, that the dispensing of either one in place of the other will jeopardize the welfare—possible the life itself—of the patient. The most that we can do is to take some action through the American Pharmaceutical Association that will minimize the danger.

The physicians of the country should be reached by an authoritative recommendation, which might perhaps come from the American Medical Association, that whenever tincture of aconite root is prescribed it should be clearly stated whether it is U. S. P., 1890, or U. S. P., 1900. Although perhaps not "scientific," the most certain distinction would be by the words "old" or "new;" "1890" or "1900" would be almost as quickly written, and would be preferable were it not that physicians would much more often miswrite the date than the distinctive adjective. "10 per cent." and "35 per cent." might be used, and would not be liable to be confused by the prescriber.

The 10-per-cent. tincture is *per se* much to be preferred to the 35-per-cent. one, yet the prediction may be hazarded that the old tincture will continue to be used by the great majority of prescribers, who will realize that it is this tincture with which they will have to keep up an acquaintance in all their reading of the past literature of their profession.

It is interesting to note how arbitrarily changes in the strength of tinctures have been made, in the direction of a wholly unessential mathematical uniformity, regardless of the really important consideration of dose. Time was when the ordinary strength of a tincture was assumed to be two troy ounces to the pint. Under the influence of the decimal system this gave place to the ratio 15 : 100. The ratio, however, was not universal, and in case of drugs used in doses of a grain or more, 20 : 100 was adopted as more practical, while in a few cases 5 : 100 was recognized as reasonable.

Two mathematical considerations entered into the problem, viz., the percentage composition of the tincture and the dose. Of these the latter is quite as important as the former. If one only is to be retained it should be the latter, so that the physician could learn once for all that the average dose of a tincture is a fluidrachm, or else that there are two classes of tinctures, the ordinary, with dose of a fluidrachm, and the potent, dose one-fourth fluidrachm. This idea has been carried out in the British Pharmacopœia, but it has been quite lost sight of in the present revision of the U. S. P., save that a vague distinction is made between "potent" (10 per cent.) and "ordinary" (20 per cent.) tinctures.

Yes, the tinctures of the U. S. P., 1900, are fairly satisfactory in mathematical uniformity, but how easily the whole class could be spared! Incidentally it may be pointed out that one of the most important of all the tinctures, tincture of iodine, although included in the international list of potent tinctures, has not been brought to the uniform ten-per-cent. standard, although, considering the presence in it of potassium iodide, it is possibly as "strong" as a ten-per-cent. tincture would be.

Tinctures, even of such drugs as aconite and belladonna, are still made exclusively directly from the drug. Why it should be considered proper and wise to prepare an ex-

tract sometimes by evaporating a fluidextract, but quite out of the question to make a tincture by diluting a fluidextract, even when that fluidextract has been brought to a definite standard strength by assay, is a mystery past fathoming. The drug used for making a tincture must be of standard strength. It will not do to use a drug that falls short, say 10 per cent., of the official standard, making the yield of tincture 90 per cent. of the normal, although there is nothing to forbid a similar procedure in making a fluidextract except the fact that every drug used for any purpose in the Pharmacopœia is assumed to be of official strength. The official fluidextract of ipecac will find no favor with pharmacists because it is loaded with resinous matter, and so cannot be mixed directly with syrup to make the official syrup of ipecac. Manufacturers have for many years supplied such a fluidextract, which will continue to be used to the exclusion of the official product.

The most radical change that appears in the new Pharmacopœia is the substitution for definite, practical requirements, under a specified method of quantitative testing, of a general demand for a certain percentage of "purity." Potassium nitrate, for example, must (the wording is "should") contain not less than 99 per cent. of pure potassium nitrate. It is explained in the Preface, p. xxxviii, that this means that the thoroughly dried salt must contain not more than 1 per cent. of any foreign substance. Moisture, up to 3 per cent., is not to be accounted an impurity. Specific tests are given to prove the absence of iodide, chlorate and perchlorate, and of "heavy metals." It is up to the chemist to prove that the salt contains 38.31 per cent. of pure potassium and 60.69 per cent. of the NO_3 radical, and that these are combined with one another. Suppose that there is actually present 1 per cent. of potassium chloride and 1 per cent. of sodium nitrate, together with, say 0.25 per cent. of magnesium sulphate, such a sample would show about 38.34 per cent. potassium and 60.66 per cent. of the nitric radical, making altogether apparently 99 per cent. of pure potassium nitrate, and yet there is present 2¼ per cent. of impurity. It is easy to see what apparently conflicting reports two expert chemists might make—one approving, the other condemning, the sample. It is held that the purity statement leaves no opportunity for debate or difference with regard to any sample. Apart from the divergences of result certain to be found in the reports of commercial chemists, divergencies inevitably present in greater or less degree in all results where the method of analysis is not prescribed, it is clear that purity statements which can be verified only by two or more quantitative determinations leave plenty of opportunity for differences in the testimony of experts, with the usual result of bringing into discredit expert chemical testimony generally.

On the other hand a definite requirement that a certain method of assay, described in detail, shall indicate a specified degree of purity leaves no room for controversy, except regarding the competence of the chemist who reports the result.

All results of chemical analysis are provisional. Every year sees corrections adopted by chemists in the atomic weights of the elements—the constant—relied upon in interpreting the results of quantitative experiments. In view of these facts it seems to the writer clear that no statement of a purity requirement should be made without a specification of the method to be used in making the necessary determinations. This is the plan that has been followed in previous editions of the Pharmacopœia, and is the only one that will permit the ordinary graduate in pharmacy to test his own drugs, which he surely should be able to do.

Of course the tests must be such that it will be difficult or impossible for any one to devise a method of adulteration that will escape detection. This commonly is not difficult.

One of the most important new features of the Pharmacopœia of 1900 is the introduction into it of numerous assay processes for potent drugs like belladonna and their preparations. The processes are generally so simple that any competent pharmacist should be

able to carry them out, and they are described in every detail, so that even the beginner should almost certainly succeed in carrying them out.

Some of them may be criticised on the ground that they seem to be too much simplified. In the assay of cinchona bark and of its preparations it is thought sufficient to use in the final extraction of the alkaloid simply a definite volume of ether, used under specific conditions, to determine the ether-soluble alkaloids, which are assumed to consist of quinine, quinidine and cinchonidine. Although the plan seems a crude one, it answers well its purpose as a practical method of determining the value of the bark. It was adopted only after a series of experiments on mixtures of the cinchona alkaloids in varying proportions. It was found in practice to yield more uniform results than methods seemingly more scientific, and when applied to known mixtures of alkaloids was found worthy of all confidence.

A general criticism may be made on the methods of alkaloidal assay, that they do not attempt to identify the alkaloid separated. They do not contemplate the possibility of fraudulent addition of foreign alkaloids. No doubt in time it will be necessary to guard against this iniquity; the subject is one yet to be studied.

In the quantitative test for sulphuric acid, page 23, it would be better to take 1 Cc. of the acid for the titration rather than three. The latter would call for more than 100 Cc. of the volumetric alkali. In general it may be remarked that the quantity of material prescribed for a titration should be such that between 20 and 30 Cc. of the volumetric solution would be required. A smaller quantity necessitates very close readings of the burette.

The salts of quinine are tested as in the old Pharmacopœia by the ammonia test, which is made a little more stringent, in that now no more than 6 Cc. of ammonia water in place of 7 Cc. must be required to redissolve the precipitate at first found.

In the old Pharmacopœia it was provided that if the temperature during the digestion were 16° C. instead of 15°, the quantity of ammonia water required must not exceed 7.5 Cc. It would have been much better to make "exactly 15°" mandatory, making no concession to laziness on the part of the operator.

The new Pharmacopœia requires that the digestion be carried on at 15° C. during two hours. Then if the temperature be permitted to rise two degrees—although this could not by any possibility bring again into solution the quinine sulphate which has crystallized out—we may count the quinine as of standard purity if 7 Cc. of ammonia water yield a clear solution. The writer is not contending that the requirement of the old Pharmacopœia was too lax, but simply insisting that in a test of this kind the requirement of a certain fixed temperature (in this case 15° C.) should be made imperative.*

The several tests for the purity of the different quinine salts are still open to the very serious objection that the same weight of the genuine salt is taken in each case without regard to the percentage of quinine in the salt. The test is therefore relatively much more stringent in the case of quinine (alkaloid) than it is in the case of quinine bisulphate. The inconsistency of this was pointed out long ago by Dr. Prescott, and has been commented upon by others, so that the Revision Committee sinned not from ignorance.

In applying Kerner's test to quinine sulphate the salt must be first dried to break up a molecular combination of cinchonidine and quinine sulphates. In the several pharmacopœial tests the routine drying of the salt, or of the alkaloid itself, "for two hours at 50° C." is made a part of the test. It is omitted only in the case of quinine salicylate. Is there any good reason for embarrassing the assay with this time-consuming detail?

Quinine salicylate is to be decomposed by ammonia, the alkaloid shaken out with ether, and after evaporation of the ether is to be converted into a sulphate by the addi-

* It has been recently proposed to substitute lime watter for ammonia water in the Kerner test. The subject may well be investigated by your Committee.

tion to its alcoholic solution of "just sufficient" sulphuric acid. How the point of exact neutralization is to be determined is not specified, although obviously this is a matter of the greatest consequence. The same criticism may be made on the assay of quinine bisulphate; in the case of quinine (alkaloid), hematoxylin is specified as indicator.

In the assay of oil of peppermint for menthol there is an inaccuracy (repeated in other similar assays) in the calculation which may vitiate the result by fully one per cent. The calculation is so intricate that it is not easy to explain it clearly. It would be better merely to state arbitrarily that not more than a certain stated quantity of half-normal sulphuric acid V. S. should be required to neutralize the excess of alkali. Compare assay of oil of rosemary for borneol.

There is an inconsistency between the statements of solubility in water of phenol and of liquified phenol. There is a similar inconsistency between statements of the solubility of sodium carbonate monohydrated and that of the sodium carbonate of the former Pharmacopœia.

Sulphur is to be tested for arsenic by digesting with ammonia water, filtering, evaporating the filtrate to dryness, treating the residue with nitric acid and again evaporating. At this stage, if arsenic is present, it must be in the form of arsenic pentoxide. The residue is to be dissolved in 10 Cc. of hydrochloric acid and then tested by Gutzeit's test. Instead of this the residue should be reduced with sulphuric and sulphurous acids, as directed on p. 522.

Notices of the new Pharmacopœia that have appeared in the medical journals are, for the most part, quite colorless, giving a general account of the changes that have been made in the revision and approving of the work as highly creditable to our country. The comments are sometimes edifying. One reviewer makes the belated discovery that "pulvis" in the name of a simple powdered drug (*e. g.*, opium pulv.) follows the name of the drug, while in compound powders the "pulvis" comes first. The same reviewer approves the adoption of arseni trioxidum in place of acidum arsenosum, and then betrays his ignorance of the distinction by adding "but there is still a preparation entitled liquor acidi arsenosi."

Among criticisms offered of the new Pharmacopœia, one that seems quite just is the needless omission of the various preparations into the composition of which each article enters.

In the matter of nomenclature the new Pharmacopœia has maintained wisely in general a conservative attitude. That acidum arsenosum should give place to arseni trioxidum and acidum chromicum to chromii trioxidum was made imperative by the meaning now attached by chemists to the word acid. It was not necessary to abandon the convenient terms potassa, soda and magnesia, which, although no longer used by chemists, are not ambiguous in meaning. In this case the revisers seem to have lost sight of the importance of brevity in names to be used by prescribers. Liq. pot. hydrox. for liq. potassæ is a bit pedantic. Magnes. oxid. pond. is needlessly unwieldy. In the case of calx conservatism prevailed—mainly on account of the difficulty of accounting for such compounds (?) as sulphurated lime and chlorinated lime. There was inconsistency, however, in retaining liquor calcis by the side of liquor potassii hydroxidi. Certainly if calx is calcium oxide, liquor calcis is not a solution of calcium oxide.

Heretofore the purity of the Latin of the Pharmacopœia has been carefully guarded. Classical scholars will regret to see in the new revision such barbarisms as alcoholis and amylis, and yet inflexion of foreign words is not unknown in classical Latin. We had already made coca a noun of the first declension as does also the British Pharmacopœia.

To be consistent, the word chloral should also have been made declinable, genitive chloralis. Chloral hydrate in the British Pharmacopœia is chloral (indeclinable) hydras. For some inscrutable reason our Pharmacopœia calls the compound hydrated chloral,

chloralum hydratum, while it retains "hydrate" in the name of the terpin compound, "terpini hydras."

The definition of berberis is defective, in that it permits the use of any species of berberis in place of B. aquifolium. The word "certain" before "other" would have been more explicit, but even this should have had some limitation, such as "indigenous in the states of the far west," or belonging to the subgenus mahonia.

Cassia fistula is described as the fruit of the tree producing it. The dose given, however, is that of the *pulp*, and should be so stated. In like manner, the dose of colocynth is that of the drug *deprived of seeds*. The solubility of chrysarobin in different solvents is given with painful exactness, although one cannot but suspect that the 18 parts of chloroform and the 25 parts of benzene are approximate figures.

The dose of colchicine is given as only 0.0005 Gm., while that of colchicum seed, containing 0.55 per cent. of colchicine, is 0.2 Gm.

On page 164, the note appended to the assay process for metallic iron in reduced iron is not intelligibly expressed. The note might read "the percentage purity of the iodine employed should be accurately determined by a previous experiment, and the weight of the iodine taken corrected accordingly before dividing by 0.02518 in the above calculation."

In the assays of guarana and of its fluidextract, provision is made for the extraction of other alkaloids as well as caffeine [as in the assay of kola], and the expression "alkaloids from guarana" is used in place of caffeine. In fact guarana is not known to contain any alkaloid except caffeine.

Liquor iodi compositus is described as an aqueous solution which should contain not less than five per cent. of iodine. Since the official iodine contains a minimum of 99 per cent. pure iodine, the assay is made to require 4.95 per cent. of the iodine known to the chemists. In the text the word "pure" is omitted, so that the assay does not coincide with the purity statement.

The chemical formulas in the text are generally given in a completely "analyzed" form. To the writer this seems pure pedantry, but the plan if adopted should be carried out consistently. A number of exceptional cases might be pointed out, *e. g.*, calcium sulphate on page 84, written $CaSO_4$ instead of $SO_2.O_2Ca$.

The requirement of 60 per cent. of calcium sulphide in calx sulphurata is too stringent. That of the British Pharmacopœia—50 per cent.—is reasonable.

On page 119 the formula under cresol is misplaced.

Ferric chloride is prepared by evaporating 100 parts of the solution to forty. The solution contains 10 per cent. of metallic iron. The solid product should, therefore, contain 25 per cent. of iron; the requirement is for only 22 per cent. In the assay process it is specified that the salt taken for assay be "dry." This cannot mean anhydrous, since it is not possible to drive off all the water without partially decomposing the salt. One must conclude that allowance is made for hygroscopic moisture in a product which is apparently "dry."

Qualitative tests for such common impurities as sodium (in potassium salts) and sulphuric acid (*e. g.*, in potassium iodide) no longer hold the prominent place they seem entitled to. They have been omitted as of no importance, provided the article comes up to the purity requirement. It would seem to be a wiser way to recognize the possibility that these impurities may be present in amount too considerable to be tolerated. If the qualitative test is applied to a solution diluted to a specified degree, it could easily be demanded that no more than a faint trace of the impurity should be shown.

For calcium carbonate no titration test is given, although such tests can be very easily made. There is no test given for the common impurity magnesium, but this omission may have been intentional.

Calx is to be made from white marble or from the purest varieties of native calcium

carbonate, and yet it is permitted to contain 10 per cent. of impurity. This cannot be carbonate, as any considerable amount of that impurity is specifically prohibited. It cannot be magnesium oxide, since it has been prepared from a pure variety of native calcium carbonate. No quantitative test is proposed. None is really needed—neither is the purity requirement of 90 per cent. needed.

For elixir, iron, quinine and strychnine phosphates, an assay process should be given. Comparatively few druggists will make the elixir themselves, particularly by a formula so troublesome.

In three of the fluidextracts of the new Pharmacopœia, diluted acetic acid is used as a menstruum. While it may be that the products are superior in every respect to fluidextracts made with an alcoholic menstruum, it seems to the writer that they belong to a class quite as distinct as the official vinegars (aceta). One would not think of proposing the use of diluted acetic acid as a menstruum for a *tincture*. There ought to be a distinctive name for the acetic fluidextract.

The new fluidextract of squill is made by percolating the drug with the acetic menstruum (about 10 per cent. absolute acid) until from each kilogram of drug there has been obtained a liter of product. While this plan will not completely exhaust the drug, it may be expected to extract the greater part of the active principle, and to yield a product tolerably uniform in quality, provided it is made from a drug of standard strength.

In the case of lobelia, and in that of sanguinaria, a different plan is adopted. The first 850 or 900 Cc. of the percolate is reserved, percolation is carried on to exhaustion of the drug, and the weak percolate, containing 10 per cent. acetic acid, evaporated to a soft extract and dissolved in the reserved portion. This mode of procedure does not commend itself when practiced on a small or a large scale. Repercolation is the only proper way to make this class of products, but the Pharmacopœia knows nothing of repercolation. It may be safely predicted that outside of the laboratories of pharmaceutical schools there will not be a dozen pounds of these fluidextracts made by the pharmacopœial process.

Scopolamine is stated to be an alkaloid obtained from "scopola" and other solanaceous plants. The "scopola" is not capitalized, and yet can hardly be taken to mean anything but the official scopola (*S. carniolica* Jacq.). The name of the species of scopola from which the alkaloid is derived should have been given, and the "other plants" should have been specified, or at least the expression changed to "some other plants." The identity of scopolamine with hyoscine is affirmed without sufficient warrant. Isomers are not now considered chemically identical. In the analogous case of atropine and hyoscyamine we now know that this kind of chemical "identity" does not justify the dispenser in substituting one for the other. Therapeutically they differ widely one from the other.

The Revision Committee was not called upon to settle the disputed question whether scopolamine and hyoscine are therapeutically identical. It is a fact that manufacturers have assumed this, and that when physicians prescribe hyoscine they almost invariably get scopolamine. It was to justify this substitution that scopolamine was made official, but the Pharmacopœia should not have committed itself to an opinion on a scientific question as yet undecided.

The synonym syrup of calcium hydroxide for syrupus calcis is lacking in chemical exactness. The calcium exists really as a sucrate.

Among the requirements for amyl alcohol, p. 520, not the least important is: "It should leave no residue on evaporation."

The criticism always made by physicians on the Pharmacopœia is that there is almost nothing in it for the physician. It enumerates and describes elaborately the several articles used in medicine, but says almost nothing of the preparations of those medicines which they habitually use. They rarely prescribe tinctures. Even fluidextracts are going

out of fashion. The demand is for remedies pleasant to take, and "elegant pharmacy" has almost no place in the Pharmacopœia. Physicians are compelled, therefore, to look to manufacturers for remedies they are willing to prescribe—and to accept the interested statements of manufacturers with regard to the therapeutical uses of the several preparations. This is not at all as it should be. Physicians themselves should be the ones to select the combinations they desire to prescribe, as in the beginning they did in constructing their pharmacopœias. Under the changed conditions it is no longer to be advised that the Pharmacopœia as a book of standards should also serve as a book of selected formulas.

Such a book exists in the National Formulary. It seems to the writer that the time is come when official recognition should be given to the National Formulary, which should be a work prepared with as much care as the Pharmacopœia itself, and by a similar representative body of both physicians and pharmacists. It is for the A. Ph. A. to take the initiative in a movement to secure this highly desirable result.

Signed, A. B. LYONS, *Chairman.*

Mr. Sheppard read a telegram from Mr. John Uri Lloyd, of Cincinnati, expressing regret at his inability to be present, and asked authority to transmit a suitable reply in the name of the Section, and the request was granted.

Mr. R. W. Moore, of the Government service, at request of the Chair, then presented in abstract a paper on the quality of drugs coming into the port of New York:

THE QUALITY OF DRUGS COMING INTO THE PORT OF NEW YORK.

BY RUSSELL W. MOORE, A. M., M. SC.

Chemist in Charge of Laboratory of U. S. Appraiser, New York.

The inspection of drugs imported at New York is regulated by the Revised Statutes. The provisions of law recognize the standards of the United States, Edinburgh, London, French and German Pharmacopœias and dispensatories. Thus drugs from Germany are subject to the standards of that country only, and the same is true of the other countries mentioned. Drugs from countries other than the above are held to the standards of the United States. The law also specifies some of the principal drugs with the special tests which are stated to agree with the standard authorities to which the law refers. These are as follows:

Aloes, when affording 80 per cent. of pure aloetic extractive.

Asafetida, when affording 50 per cent. of its peculiar bitter resin and 3 per cent. of volatile oil.

Bark, cinchona, when affording 1 per cent. of pure quinine, whether called Peruvian, Calisaya, Arica, Carthagena, Maracaibo, Santa Martha, Bogota, or under whatever name, or from whatever place.

Bark, cinchona, when affording 2 per cent. of the several natural alkaloids, combined, as quinine, cinchonine, quinidine, aricene, etc., the barks of such strength being admissible as safe and proper for medicine, and useful for chemical manufacturing purposes.

Benzoin, when affording 80 per cent. of resin.

Benzoin, when affording 12 per cent. of benzoic acid.

Colocynth, when affording 12 per cent. of colocynthin.

Elaterium, when affording 30 per cent. of elaterin.

Galbanum, when affording 60 per cent. of resin.

Galbanum, when affording 19 per cent. of gum and 6 per cent. of volatile oil.

Gamboge, when affording 70 per cent. of pure gamboge resin and 20 per cent. of gum.

Guaiacum, when affording 80 per cent. of pure guaiac resin.

Gum ammoniac, when affording 70 per cent. of resin and 18 per cent. of gum.

Jalap, when affording 11 per cent. of pure jalap resin whether in root or in powder.

Manna, when affording 37 per cent. of pure mannite.

Myrrh, when affording 30 per cent. of pure myrrh resin and 50 per cent. of gum.

Opium. The importation by Chinese subjects of opium is prohibited. Before removal from custom-house, prepared smoking opium must be stamped so that, while not covering the label, the stamp will be broken or defaced on the opening of the package; and the officer affixing the stamp will write thereon the date, his name, and the name of the vessel, of the importer, and of the port. The percentage of morphine contained in imported crude opium must be ascertained by what is known as Dr. Squibb's method of analysis.

Rhubarb, when affording 40 per cent. of soluble matter, whether in root or powder. None admissible but the article known as East India, Turkey, or Russian rhubarb.

Sagapenum, when affording 50 per cent. of resin, 30 per cent. of gum, or 3 per cent. of volatile oil.

Scammony, when affording 70 per cent. of pure scammony resin.

Senna, when affording 28 per cent. of soluble matter.

The tariff further provides as follows: Opium crude or unmanufactured and not adulterated, containing nine per centum and over of morphine, one dollar per pound; opium containing less than nine per centum of morphine, six dollars per pound.

The method of inspection pursued is as follows: The invoices are examined and the names of the shipper and consignee noted, also the price. The drugs are placed on the examining floor and examined by an official who at New York has had both medical and pharmaceutical experience. If the appearance and evident quality of the drugs are satisfactory, no further examination is made and the invoice is passed and the drugs delivered to the importer. If, however, there is reason to think the drugs are of inferior quality, samples are taken and assayed. If below the

standard they are rejected and not allowed to come into the United States. The importer, however, can question the analysis and call for a further determination by a chemist not a government official, who is selected by the Collector of the Port. The results of this analysis are final regarding the admission of the drugs if the methods followed are satisfactory to the Secretary of the Treasury. It will be seen that the Laboratory of the Appraiser has only to do with drugs whose quality is not satisfactory to the Examiner, hence the per cent. of drugs below standard is far greater in the results reported by the Laboratory than in the whole quantity entered. Personally I can only speak of drugs analyzed and reported, the great bulk of drugs being examined and passed by the Examiner without chemical analysis.

From time to time I have published in the Journal of the Society of Chemical Industry notes covering numerous analyses of various drugs, always giving the method used in the assay. The number of samples so reported has been considerable and I think furnishes instructive results.

ASAFETIDA.

This drug has been the subject of much examination. The quality at one time was so inferior that samples were frequently met with which contained less than ten per cent. of resin instead of fifty per cent. as required by the standard. The adulteration was very apparent; consisted of a generous addition of crystalline gypsum. Two sets of samples tested in 1899 and 1900 show the good effect of enforcing the legal requirements.

Per Cent. of Resin.	No. of Samples.		Per Cent.	
	1st Set, 1890.	2d Set, 1900.	(1) 1899.	(2) 1900.
1 to 10	13	0	7.93	0
10 to 15	49	0	29.88	0
15 to 20	61	5	37.19	3.33
20 to 25	19	3	11.58	2.00
25 to 30	7	6	4.27	4.00
30 to 35	4	10	2.44	6.67
35 to 40	3	18	1.83	12.00
40 to 45	2	25	1.22	16.66
45 to 50	0	12	....	8.00
50 to 55	..	37	....	24.67
55 to 60 (Above 50)	6	21	3.66	14.00
Above 60	..	13	....	8.67
Total	164	150	100.00	100.00

The Treasury regulations call for the presence of 50 per cent. of resin, and the fact that in one case only 3.66 per cent. of the samples examined were of the requisite purity,

while within six months this percentage rose to 47.75, shows that the enforcement of the Treasury regulations results in a marked improvement in the quality of the drug imported.

JALAP.

Many analyses of jalap have been made, with varying results. In 1904, ninety-eight samples were assayed, of which twenty-eight were below the standard of eleven per cent. of resin. The maximum found was 23.34 per cent., the minimum 6.14 per cent., with an average of 12.60 per cent. Since that time two hundred and seventy-six samples have been assayed, of which only twenty were equal to the standard. The maximum content of resin was 15.63 per cent., the minimum 2.10 per cent. and the average 5.95 per cent. The lowering of the standard in the recent revision of the Pharmacopœia appears to be fully justified. Of the inferior jalap imported much was small and immature. Some had been carelessly and imperfectly dried and had heated and discolored considerably. Evidently little care is exercised by the gatherers of this drug.

GUM GUAIAC.

One hundred and twenty-four samples were reported by the laboratory, of which sixty-nine were below the standard of 80 per cent. of resin. The maximum amount of resin found was 91.40 per cent., the minimum 61.70 per cent. and the average 77.92 per cent. Here again the crude and careless methods used in collecting the drug were frequently evident. Fragments of wood and bark were present to an extent sufficient to render the drug friable, dull of fracture and porous. A sample melting and straining through coarse cloth would have in most cases produced a drug of satisfactory quality.

SENNA.

Senna generally is of good quality, six samples showing an average content of soluble matter of 37.06 per cent. and in every case well above the standard of 28 per cent.

OPIUM.

Opium is a dutiable crude drug, on which one dollar a pound is paid. The quality of the imported article is generally good, as its rejection would be a costly matter. Of 309 samples examined, only 19 were below the standard of 9 per cent. morphine.

IPECAC.

Ipecac has been the subject of much attention on the part of customs authorities. For a long time it was held that only the Rio ipecac was the true official variety and that Cartagena ipecac should be excluded as spurious. It was finally decided to admit Cartagena ipecac, provided it contained 1.8 per cent. of total alkaloids. Of two hundred and four samples examined, ten were below this standard.

LUPULIN.

While lupulin is examined as a drug, it is mainly used in brewing. The indirect estimation of quality by means of an ash determination was held to be less satisfactory than a direct estimation of the valuable or ether-soluble portion. Twenty-five samples were tested, of which only two contained less than the standard of ten per cent. of ash, while twelve were above the minimum of seventy per cent. of ether extract. The ash allowance of the British Pharmacopœia of fifteen per cent. seems entirely compatible with the seventy per cent. of ether extract of the U. S. Pharmacopœia.

Other drugs, such as cantharides, rhubarb, balsam of copaiba, aloes and gentian, have been from time to time examined, but the number of analyses is not sufficient to be instructive.

At no port in the United States is a more careful examination made of the quality of imported drugs or as many analyses made to determine their quality. Adulterated imported drugs are met with in the market in spite of all the vigilance employed, but it is safe to assert that the New York customs authorities are not responsible for them.

Independent of customs inspection, the drug-importing trade demand better and finer drugs than formerly, and the assay of drugs is more extensively made to determine their value.

Mr. Moore stated that the inspection and control of crude drugs imported through the port of New York had had an excellent effect, and that the Government chemists had received the hearty co-operation and aid of almost all the large importing drug houses.

Mr. Hallberg expressed himself in very vigorous language on the subject of the great wrong done the American public and the profession of pharmacy by the lack of proper restriction and regulation of the importation of drugs, and said the American Pharmaceutical Association should demand of the Government protection from this great evil by the establishment of a comprehensive system of inspection, valuation and certification of such drugs coming to our ports of entry, and he offered a motion to that effect.

Mr. Wilbert drew out from Mr. Moore that the Government chemists were working under the law of 1849, which meant that the standards of the Pharmacopœia of 1840 were those used. He then moved to amend the motion of Mr. Hallberg by referring the whole question to the Committee on National Legislation, with the view of giving publicity to the fact that in this matter of absolute life and death the United States Government was working under obsolete conditions—conditions that existed fifty years ago.

Mr. Moore foresaw considerable difficulty in the way of getting the laws amended, involving as they did a revision of the tariff laws. In the first place, public opinion would be needed behind the movement. Such

a law should be one of simple provisions, easy to enforce, coupled with a clean civil service and an appropriation to do the work.

After further discussion by Messrs. Eccles, Beringer and Hallberg, the motion of Mr. Hallberg as amended by Mr. Wilbert was put to a vote and carried.

Mr. Kebler read in abstract the following paper on the adulteration of chemicals:

THE ADULTERATION OF CHEMICALS.

BY L. F. KEBLER.

In assigning the above theme for this symposium your chairman did not prescribe any limitations. I shall therefore treat the subject in its various phases from the manufacturer to the consumer. Someone has said that the findings of adulterations are numerous only because people are looking for them. The principle underlying this statement is applicable to a vast majority of human achievements. The sluggard finds nothing, his coffers are usually empty, and the world is no better for his having lived in it. In order to arrive at a proper understanding of the amount of adulteration in chemicals, it will be necessary to clearly set forth what is meant by adulteration. If we mean gross, deliberate adulteration, not including what is commonly known as substitution, the amount is comparatively small, but if we are to understand that it includes all chemicals which do not comply with the standards set by competent authorities, or which fall below the professed standards under which they are sold, the per cent. will amount considerably.

The day of gross and deliberate sophistications is largely a thing of the past, unless the reprehensible practice known as substitution be construed as having taken their place, but we still meet with them occasionally. For example, thymol replaced in part or as a whole by sodium sulphate crystals; acetyl isoeugenol, the antecedent of vanillin, delivered for vanillin; calcium phosphate replaced in part by calcium carbonate; various mixtures consisting of starch, calcium acid phosphate and calcium sulphate sold for cream of tartar; washing soda for borax; coumarin mixed with acetanilid, and potassium bromide used to fill orders for potassium iodide. The above examples represent adulterations met with before the goods reached the hands of the retailer. These frauds are frequently traceable to brokers, but manufacturers and wholesalers are not entirely free from taint. Adulterations of the above character, practiced by manufacturers, jobbers, brokers and wholesalers, do not amount to 1 per cent.

Chemicals that fall below recognized standards, or below the professed standards under which they are sold, in my experience, approximate 25 per cent. By recognized standards are meant such as are set by Krauch's book on the "Testing of Chemical Reagents," the United States, British

and German Pharmacopœias and such self-imposed standards as are found on the labels of various manufacturers. Some one may say that the first book enumerated was written to favor a certain brand of chemicals and the pharmacopœias are unreasonable. In reply to such a statement I only need to say that in my experience there are several brands of chemicals that conform to the requirements laid down in Krauch's book as well as does the brand alluded to, and the requirements for chemicals of the pharmacopœias enumerated are not so unreasonable as we are oftimes led to believe by the manufacturer. It would be absurd to claim perfection for these books, but to deny their high value and great utility would be to discredit a large field of science. As a matter of fact many manufacturers label their chemicals by designations which clearly mean that the contents of the packages comply with these unreasonable standards, or fill orders which call for goods conforming with these standards. Chemicals marked C. P. ought certainly to comply with the requirements laid down by the U. S. Pharmacopœia.

The claim is frequently presented that the impurities present are so small in amount, or are of such a harmless nature, that they could neither act injuriously or deleteriously, nor materially influence the physiological effects. If every analyist were permitted to decide whether or not impure chemicals were injurious or deleterious, or would give the results desired by the physician, there would be an endless amount of confusion and disagreement. The analyst usually has little difficulty in deciding whether a given impurity will be likely to impair his analytical results, and can act accordingly, but he is naturally not competent to say to what extent small amounts of noxious bodies or greater quantities of supposedly inactive substances will influence therapeutic activity. The numerous legislative acts which fix standards for medicinal agents bear testimony to this end.

I shall now take up a few cases from experience that illustrate this phase of the subject. *Sulphuric acid, C. P.*, contaminated with *lead sulphate; hydrochloric acid, U. S. P.*, containing free *chlorine; ammonium hydroxide, U. S. P.*, mixed with *pyridin* bodies, *calcium compounds*, and a *heavy sediment*—a very interesting chemical to use either for medicinal purposes or in analysis. *Ethyl ether, U. S. P., 1890, for anesthesia*, found to contain *aldehydic* and *disagreeable-smelling foreign bodies*, was *highly acid* and totally unfit for any use, yet the manufacturer contended that they tested their ether, and such a product could not have left their factory. This kind of talk may work with some, but it did not fit the case in hand, and the manufacturer ultimately "made good." Some manufacturers will contend that the pharmacopœial requirements are too rigid. Let me tell you there is plenty of ether produced every day that will comply with this standard. It is impossible to exercise too much care with an article that is used daily to keep unfortunate patients hovering on the brink of

the grave. *Ethyl acetate marked U. S. P.* I have found to contain from *65 to 80 per cent. of pure material*, and incidental impurities of all kinds from *fertilizer extractive odors up*. I regret to see that the eighth revision of the Pharmacopœia has lowered the percentage purity of the article. There is no trouble in producing a 98 per cent. pure article at a cost equal to the present price of alcohol. *Sodium phosphate, U. S. P.*, granular and crystals was contaminated with *arsenical compounds*. It seems as if the reprehensible practice of selling a medicinal chemical used as liberally as sodium phosphate, poisoned by arsenic, had been often enough referred to, but there is considerable on the market at present fit only for fertilizing purposes. The *iodides* and *bromides notoriously fall below* the present *standards*. It is seldom that these valuable chemicals are what they should be. There is no difficulty in making them of proper quality. *Manganese dioxide, C. P.*, containing impurities soluble in water and testing only 70 per cent. pure. There is an abundance of commercial manganese dioxide which will test from 80 to 90 per cent. pure. *Lithium citrate, U. S. P., 1890*, containing from *11 to 20 per cent. of water of crystallization*. The Pharmacopœia (1890) recognized the anhydrous salt only. No one can supply the standard product and compete with such misrepresentations. A large proportion of the samples of *calomel* examined *contained traces* of *corrosive sublimate*. It can be made without the presence of this impurity. *Glycerin*, both *C. P.* and *U. S. P.*, seldom comply with the recognized standard. Formerly it was mixed with an undue amount of arsenical compounds, but these dangerous impurities have been largely reduced to proper limits within the past few years. There is considerable *hydrogen peroxide* on the market that does not conform to the proper standard and the statements made about stability read well on the label, but too much faith should not be placed in such statements. Almost all of the *potassium cyanide* labeled as *C. P.* and *U. S. P.* consist of mixtures of *sodium and potassium cyanides*. Manufacturers and dealers are well aware of this, yet most of them continue to label it in the above manner and some label it "potassium cyanide, 98–100 per cent. pure." Sodium hydroxide, labeled "*free from aluminum, nitrogen ana sulphur*," contains all these impurities. *Potassium permanganate* and *magnesium oxide* represented as being *free from* sulphur were both contaminated with this impurity. *Copper sulphate*, labeled "*C. P., strictly iron-free*," was not in accordance with the facts. Numerous additional examples could be cited, but the above should certainly be ample to remove any doubt. Furthermore, they do not represent a single sample only, but from 50 pounds to tons.

Much has been published about adulterated chemicals and chemicals of inferior quality, but little has been placed on record which gives any idea where the trouble is and to what extent it prevails before these chemicals reach the hands of retailers and consumers. Dr. D. Base, in a paper pre-

sented to this Association last year, gave data which represented drugs examined under conditions similar to those enumerated above. Deliberate adulteration to the extent of 1.7 per cent. was detected, and after making extremely liberal allowances for the small quantities of impurities, he says, "twenty-six samples (out of 115, or 22.6 per cent.) were unsatisfactory, chiefly because of the failure on the part of the manufacturers to sufficiently purify the drugs to meet the official demands and to a less degree because of a deficiency in strength." Dr. R. Hunt, in discussing the above, spoke of a recent examination of some two hundred chemicals and, while only thirty-six (or about 20 per cent.) came up absolutely to the standards of the Pharmacopœia, there was not one where the impurity could be declared injurious. Dr. C. E. Caspari, in a paper presented before a recent meeting of the Missouri State Pharmaceutical Association, gave his finding on eight much-used chemicals, including bromides, iodides, calomel, bismuth subnitrate and sodium salicylate with the result that few of the samples answered rigidly all the requirements of the U. S. P., but there was only one case of flagrant adulteration. The results of these workers clearly show that my findings of chemicals under conditions herewith set forth are better than the average and the above representation of chemicals that fall below the standard is quite conservative.

Mr. Eliel moved that the paper be received and referred for publication.

Mr. Eccles, discussing the paper, said that a serious wrong was done the pharmacists of the country by the laws in the misuse of the word "adulteration" in connection with many chemicals. There were oftentimes slight impurities in chemicals, but not adulteration in the sense popularly understood. As an illustration, he said that on Thursday night last the druggists of the country went to bed with most of their drugs pure, and awakened Friday morning to find nearly all of them adulterated. This, in a technical sense, followed the taking effect of the new Pharmacopœia. It was both misleading and false to use the word in a sense the public did not understand or mean, and hold the pharmacists of the land to strict technical accountability, and the idea was only fostered by interested parties anxious to make it out that there was a tremendous amount of adulteration going on, in order to scare legislators into making laws to suit their own pockets. The Association should tell the public that the word "adulterated" as used in a scientific or legislative sense was entirely different from what it understood by it.

Mr. Mayo said that a proposition would be submitted later on for the appointment of a Committee on Publicity, consisting of some member of the Association in each of the larger cities of the country, who would be asked to refute in the name of the Association these unwarranted attacks upon pharmacy.

Mr. Kebler said he had no intention of casting any unjust reflection upon anyone, and he did not consider that the first and second sub-heads

in his recapitulation could be properly construed as a reflection upon the retail pharmacists; but he had stated the facts, and there was no use in smothering them. However, if the Section was so disposed, that part of his paper might be cut out entirely. He said that in Chicago and in other parts of the country, it was well known that inferior chemicals were dispensed by retail pharmacists.

After further remarks by Messrs. Hallberg, Ebert, Caspari, Dunning, Hunt, LaWall, and Fairchild, the chair stated that, without objection, Mr. Kebler's paper would be received and referred to the Publication Committee, and that the objectionable paragraph would be eliminated, as consented to by the author.

The chair announced as the committee to which would be referred President Beal's recommendation as to preservatives, referred to this Section for action, Messrs. Geo. M. Beringer, E. H. Bartley, Leo Eliel, W. A. Puckner and W. L. Scoville.

The chair stated that the time was getting short, and a good many papers would have to be read by title and referred, but that he thought the paper of Dr. R. H. True, on drug-plant investigation in the Department of Agriculture, would be of special interest, and he would ask the author to give an abstract of the paper. Mr. True complied with this request, and exhibited in connection with his paper samples of chenopodium, senna leaves, belladonna, digitalis, stramonium and hemlock seed, pyrethrum flowers, goldenseal root, and other drugs. His paper here follows:

DRUG PLANT INVESTIGATIONS IN THE U. S. DEPARTMENT OF AGRICULTURE.

BY RODNEY H. TRUE,
Physiologist in Charge.

The fact has been frequently pointed out that the United States is singularly dependent for its crude drug supply on other parts of the world, in spite of the fact that we seem to have within our own boundaries the conditions of soil and climate required for the growing of many of the products concerned. The question then naturally arises as to practicability of growing our own supply of crude drugs. To answer this query in any broad way would involve not only questions of soil and climate but also of labor, and fully as much also of the mental attitude of those who would be looked to for such work.

The mental attitude is an especially important factor in the early stages of an industry, since mere indifference or pessimism is able to effectually squelch any investigations which might be made into the possibilities of soil, climate and labor.

In order to secure such a line of investigation into our possible national resources, unlikely to be made through private means, a small allotment

has been set aside in the Bureau of Plant Industry, of the Department of Agriculture, and for a number of years the question of growing crude drugs and of getting them in shape for most profitable utilization has been receiving attention.

The products fall into two more or less well-marked groups; (1) imported products coming, in many cases from regions of which the United States does not furnish a correspondent; and (2) native products furnished by our own wild flora, weeds and cultivated plants.

In order to obtain a clear idea of the behavior of the plants supplying our crude drug demand, testing-gardens have been established in widely-separated parts of the country, where a considerable number of kinds are grown under the immediate observation of men trained in the growing and study of plants. Such testing gardens are located at Burlington, Vermont, Washington, D. C., near Florence, South Carolina, and at Pierce, Texas. At each place a considerable number of species are kept under observation. Methods of propagation are given close attention. Some plants propagate readily from seed, others from cuttings or roots. Some do better if the seed are sown in the fall, some if sown in the spring. Some plants need shade during their early stages, others need shade throughout their lives. Diseases turn up and have to be studied, the cause ascertained and, if possible, eliminated. Sometimes the trouble may be due to insect attacks. Hyoscyamus and stramonium are badly injured by the potato beetle. Elaterium is attacked persistently by the squash bugs. Even in such simple and well-known troubles as potato beetles we meet new problems, since we obviously can not supply Paris green to plants yielding leaf drugs. Soil requirements, water demands, effect of season and methods of cultivation are among the general questions which we attempt to work out for the benefit of the man who writes to the Department for information on these points, in order that he may look into drug-plant cultivation as a business venture.

In some cases we find on record, or elsewhere available, the experiences of others who have experimented along particular lines. One illustration is seen in the cultivation of the camphor tree. Private parties have demonstrated that it grows well in Florida, southern California, Texas and other parts. Many private experimenters have found that the Asiatic poppy does well over a large part of the country. Through the pioneer work, chiefly of Mr. Henry N. Rittenhouse, of Philadelphia, and Charles Lea in California, it has been shown that the licorice plant thrives in various localities in this country. After supplementing the work of these pioneers in our testing gardens we feel that the chance of making a financial success of growing these drug-plants is worth testing and, in co-operation with the office of Seed and Plant Introduction of the Department, larger plantings on a small commercial scale have been arranged for. Should we succeed in making, after perhaps much experimenting, a pro-

duct which meets the demands of the crude drug dealers, we shall be in a position to make a demonstration experiment on a small commercial scale, keeping a close debit and credit account as a very essential part of the experimental results. When results prove favorable, capital for following up the work and occupying the field is not slow in coming. Indeed, we are finding much interest displayed in our work by investors, even though our beginnings have been but small thus far.

The laboratory aspect of this work is very important. In such routine work as testing and assaying we receive the co operation of the Drug Laboratory of the Bureau of Chemistry. Many problems, however, are of a plant physiological nature, and must be dealt with at close quarters. Among these is the problem of drug-curing. It is a rather difficult task to get clearly in view the factors that count in getting the best results in appearance and quality of product. Oxidases and peroxidases doubtless play a great rôle. The conditions, external and internal, determining the formation of active principles are under study. The fertilizer may be an important factor in determining the value of the drug. Experiments in this line are now being carried out with opium poppies in relation to the morphine content.

Problems of the laboratory fall into three general classes: (1) those having primarily to do with the structure of the drug; (2) those having primarily to do with the contents of the drug; (3) those having primarily to do with the physiological action of the drug. A laboratory in pharmacology, in charge of Dr. A. C. Crawford, has been equipped for this work and we are able to make not only the usual physiological assays of the products of the testing gardens but to undertake such research work along this line on new drugs as may seem best.

I may perhaps fittingly close with the mention of a few of the plants and products now under observation. The opium poppy is receiving attention in the hope that, by extracting the alkaloids directly from the plant instead of going through the expensive process of making opium, it may be practicable to a considerable degree to use the product of American fields as a crude source for these principles instead of the sophisticated product of the East. Florida-grown camphor trees yield a very satisfactory quantity of crude gum when properly distilled, and the possibility of developing an American camphor supply at some future time is being investigated. We have grown belladonna successfully for several years in our Washington testing garden and have been much interested to learn recently that at least one firm is making use of belladonna of its own growing. Digitalis, aconite, wormwood, henbane, stramonium and many other drugs now imported to a greater or less degree are doing well with us. Among the native drug-plants receiving attention are those which are in danger of extermination in commercial quantities. These are being domesticated and brought to the basis of cultivated plants. We have

already met with success in a number of instances. Goldenseal culture is now a practicable garden proposition. Pennyroyal and lobelia inflata are being grown regularly in our testing gardens along with monarda fistulosa, Virginia snake root and others. We have both Tinnevilly and Alexandrian senna, and they are doing well with us, but since it appears clear from their behavior at Washington that the season is too short for them they are regarded as of less practical interest. At our Texas station they make an excellent growth and yield a good crop of leaves. They are hardy there and live as escapes.

Some especial interest is being taken in Echinacea angustifolia, which is doing very well at Washington, and in Rhamnus purshiana, which we have as seedlings of different ages grown at Washington, D. C., and as young transplanted trees shipped from the State of Washington. The outlook for successfully growing both seems very good.

At the South Carolina station we are working with a less number of kinds but in larger quantity. Our co-operator will market about 3,000 lbs. each of American wormseed, which pays him better than his corn and tobacco, and of peppers from Hungarian paprika seed.

Thus far we have not been able to purchase some pieces of apparatus needed to carry our work to its logical end, and cannot report on the volatile oil-containing drugs. With the purchase of suitable field-distilling apparatus we shall be in position to add this step to our investigations.

Bureau of Plant Industry, U. S. Department of Agriculture.

Mr. Beringer moved to receive the paper and refer for publication.

Mr. Beringer, commenting on the paper just read, said he had examined the samples submitted and was very much pleased with their quality. He had noticed, however, that some of the samples were not collected until they were in full flower, which was not in accordance with the best opinion on the subject. This was notably true of the samples of chrysanthemum cinerariaefolium and chrysanthemum roseum.

Mr. True said he was aware that the lobelia was a little old, but they were limited by the number of men at their disposal, and while they were digging belladonna and other roots the lobelia got by.

Mr. H. V. Arny, of Cleveland, presented the following paper on casein:

ESTIMATION OF CASEIN—A PRELIMINARY STUDY.

BY H. V. ARNY, PH. D., AND T. M. PRATT, PH. C.

The marked need for a simple and reliable estimation of casein is apparent to all chemists doing milk analysis. The only direct volumetric process—that of Deniges (Jl. Ph. et Ch., Series 6, VII, No. 1)—is too complicated for practical purposes; while the generally-accepted method of nitrogen estimation by the Kjehldahl process, involving as it does digestion with sulphuric acid and mercury, distillation of this mixture with

potassium sulphide and alkali and final titration of the distillate for ammonia with volumetric solution of sulphuric acid, and that only after separation of the lactalbumin and globulin, is even more intricate and time-consuming.

Needing a quick process, one of us tried the simple expedient of noting the amount of potash alum required for the complete precipitation of casein from milk, and the results on rough estimations were so satisfactory and pointed so convincingly to the fact that alum combined with caseine in molecular proportions, that attempt was made to bring the process within the limits of reasonable accuracy.

The scheme consisted of slowly dropping alum solution from a burette into warm diluted milk, until precipitation was complete. Experience showed that uniform heat was essential for definite results, since cold milk requires more alum for precipitation than does warm and that in proportion to heat employed.

The weakness of this process lay in the difficulty in deciding the point of complete precipitation. Yet it is a striking fact that of 1,000 samples examined during two years, 694 required 2.9 to 3.1 Cc. concentrated alum solution for precipitation of 25 Cc. milk, while the amount of solution for the entire 1,000 samples ranged only from 2.6 to 3.2 Cc. to 25 Cc. milk.

The writers have since found that Schlossman (Ztschr. physiolog. Ch., vol. 22, p. 197) employed a concentrated alum solution for the separation of casein from the other milk albuminoids; estimating the amount of casein, however, by submitting the precipitate to the Kjehldahl process. It is interesting to note that he mentions that 1 to 1.5 Cc. concentrated alum solution is necessary for the complete precipitation of casein from 10 Cc. milk, thus confirming the writers' figures on 25 Cc. milk, given above.

Finding the estimation satisfactory in principle, efforts were made toward greater accuracy. In using alum solution alone, the end of precipitation is obscured by a slight greasiness of the liquid and attempts were made to obviate this by addition of alkali, such as sodium carbonate, bicarbonate or borate. While these did aid in giving a clearer precipitation, their use complicates final calculations and was abandoned.

The next efforts were toward proving the end of reaction by indications of alum in the whey, but work in this direction was hampered by lack of a delicate color reagent for alum. Decoction of logwood, suggested by Mrs. Richards (Leffmann's Water Analysis, 1895, p. 59) gives a brilliant color test, but experiments proved that it was not sufficiently delicate for the dilution of alum found in the whey.

Failing to find a sensitive color test of potash alum, attention was turned to ferric alum, experiments showing that both ferric and chrome alums precipitated casein from milk with the same facility as does potash alum.

The first plan was to add a decinormal ferric alum solution to diluted milk, filtering a few drops of the whey upon a crucible top, and bring in contact with the filtrate a drop of solution of potassium ferrocyanide or of potassium sulphocyanate. The results of these experiments were far from satisfactory, it being found that the end reaction was scarcely more sensitive in the high degree of dilution required than it was with alum and logwood decoction.

An interesting fact noted was that the filtrate did not respond to the iron test with the reagents until long after all the casein had been precipitated; while on the other hand, when the ferrocyanide solution was first treated with acetic acid, the response was much earlier. This phenomenon is evidently due to the fact that the albumin of the milk forms a soluble iron albuminate, which does not respond to ferrocyanide until decomposed by acid. This may eventually lead to a quick method of estimating total proteids of milk, but so far, results obtained have been too variable for practical use.

Failing of results along all these lines, trial was made of precipitating milk with a definite excess of decinormal ferric alum solution, filtering off the precipitated casein and estimating amount of ferric alum remaining in the filtrate by titration with potassium iodide, hydrochloric acid and decinormal sodium thiosulphate. The process at present employed is as follows: 20 Cc. decinormal ferric alum solution (48.1 grammes to the liter) is mixed with the desired amount of milk—5, 10, 20, or 30 Cc.—at ordinary temperature, some water added, the mixture shaken and allowed to stand a few minutes and then filtered, the precipitate being washed until the washings are free from iron. Either the whole filtrate or half of it is titrated with potassium iodide, acid and thiosulphate and thus the amount of unused ferric alum is ascertained. The difference in the amount of ferric alum in the original solution and the amount used gives the quantity of ferric alum required for precipitation of casein.

Figures on this work are here given:

TABLE I.

All samples treated with 20 Cc. decinormal ferric alum solution.

Milk sample.	Cc. milk used.	Cc. decinormal thiosulphate required.	Cc. decinormal ferric alum used by milk.
1a	10	16.2	3.8
1b	10	16.2	3.8
1c	5	18.2	1.8
1d	5	18.4	1.6
2a	10	16.4	3.6
2b	10	16.4	3.6
2c	5	18.0	2.0
2d	5	18.0	2.0
2e	5	18.0	2.0
3a	5	17.9	2.1
3b	5	18.0	2.0
3c	10	16.2	3.8
3d	10	16.0	4.0
3e	15	14 4	5.6
3f	15	14.4	5.6
4a	25	9.8	10.2
4b	25	9.8	10.2
5a	20	12.0	8.0
5b	20	12.2	7.8
5c	10	16.0	4.0
5d	10	16.0	4.0
6a	20	12.0	8.0
6b	20	11.8	8.2
6c	10	16.0	4.0
6d	10	16.0	4.0
7a	30	8.0	12.0
7b	30	8.0	12.0
7c	20	12.0	8.0
7d	20	12.0	8.0
7e	10	16.0	4.0
7f	10	16.2	3.8
8a	5	18.0	2.0
8b	5	18.0	2.0
8c	10	16.0	4.0
8d	10	16.0	4.0
8e	20	12.0	8.0
8f	20	12.0	8.0
9a	20	11.8	8.2
9b	20	11.8	8.2
9c	10	15.8	4.2
9d	10	15.9	4.1
10a	5	18.0	2.0
10b	5	18.0	2.0
10c	10	16.2	3.8
10d	10	16.0	4.0
10e	20	11.8	8.2
10f	20	12.0	8.0

As shown by above figures, the results are definite as to casein content. It will be observed that the amount of ferric alum used for 5, 10, 20 or 30 Cc. milk is in direct proportion to these amounts and that the variation on different samples of milk is no greater than would be expected of its varying casein content.

The feasibility of the process depends on whether the other constituents of the milk, such as sugar and fat, enter into the reaction with ferric alum. The following experiments seem to show that such fears are groundless:

Filtrate from 10 Cc. milk plus 20 Cc. ferric alum solution required 16.2 Cc. decinormal thiosulphate solution. Filtrate from 10 Cc. same milk plus 0.4 Gm. milk sugar (same amount as in original milk) required 16.2 Cc. decinormal thiosulphate solution.

Thus, in one sample of milk, there was twice as much sugar as in the other and yet the amount of thiosulphate required was practically the same in both cases. In connection with this, Long (Jl. Am. Ch. Soc., vol. 19, p. 683) has published elaborate work showing that sugars eventually reduce ferric salts to the ferrous state. However, he notes that the change is first noted after standing 48 hours and in the present process, the entire time, from adding ferric alum to milk to the final titration, need not exceed 6 hours, hence the results given above in no way run counter to Dr. Long's statement.

As to influence of fat:

20 Cc. milk plus 20 Cc. ferric alum solution required 12 Cc. thiosulphate solution.

20 Cc. milk plus 20 Cc. ferric alum solution required 11.6 Cc. thiosulphate solution.

20 Cc. milk plus 0.6 Gm. butter plus 20 Cc. ferric alum solution required 11.6 Cc. thiosulphate solution.

20 Cc. milk plus 0.6 Gm. butter plus 20 Cc. ferric alum solution required 11.6 Cc. thiosulphate solution.

Thus, double the theoretical amount of fat does not affect results.

As already mentioned, the question of the temperature of the milk is of the greatest importance and the figures of a large amount of preliminary work with ferric alum were rendered useless for this paper because the mixture of milk and ferric alum was warmed before filtration. Later experiments showed that, unlike the precipitation of casein with potash alum, heat was not necessary to facilitate the filtration of whey and led to the variation in the figures obtained.

Heat effects the coagulation of ferric albuminate, while, in cases of cold admixture, it remains in solution or at most in soluble colloidal form. Thus, if the filtrate from a ferric alum precipitate is divided into two portions and one-half is titrated just as it is, while the other half is boiled and filtered and the second filtrate titrated, the latter requires much less thiosulphate solution than does the first half.

Time has prevented careful investigation of this important point, within which possibly lies the germ of a volumetric estimation of total proteids in milk, even as does the cold process give us the amount of caseins.

It will be noticed that with practically all samples reported in Table I, 10 Cc. milk required 4 Cc. decinormal ferric alum solution (0.1924 Gm. ferric alum) for precipitation of casein. This factor is, however, insufficient as a standard of milk-testing, and therefore a line of comparative tests between amounts of ferric alum consumed and amount of nitrogen in the casein by the Kjehldahl process was instituted.

In this line of experiments, 20 Cc. decinormal ferric alum solution was placed in a Kjehldahl distilling flask and 10 Cc. milk and about 20 Cc. water added. The precipitate was transferred to a filter, washed free from soluble iron, and the filtrate titrated with decinormal thiosulphate solution. The precipitate and filter were dried, placed in the original dried Kjehldahl flask, to the walls of which some of the precipitate still remained clinging. The contents of the flask were then digested with sulphuric acid and mercury, distilled with potassium sulphide and alkali, and the liberated ammonia was titrated with decinormal sulphuric acid. Blank experiments, including filter paper, were carried on at the same time and correction made in the casein estimation.

The results are shown in appended table :

TABLE II.

In all, 10 Cc. milk was mixed with 20 Cc. decinormal ferric alum solution, the filtrate titrated with decinormal sodium thiosulphate solution, while the precipitate was assayed for nitrogen by the Kjehldahl process. In the columns marked "Percentage Casein" "a" gives the figures obtained by multiplying weight of nitrogen by 6.25 × 10, while "b" gives results in using factor 6.38 × 10.

	Filtrate.			Precipitate.		
Milk Sample.	Cc. decinormal thiosulphate required.	Cc. decinormal ferric alum used by milk.	Cc. decinormal sulphuric acid needed.	Amt. nitrogen in Gm.	Percentage Casein a.	b.
1a	15.8	4.2	25.5	0.0357	2.23	2.28
1b	16.0	4.0	25.0	0.0350	2.19	2.23
1c	16.0	4.0	26.0	0.0364	2.27	2.33
2a	16.1	3.9	24.0	0.0336	2.10	2.14
2b	16.0	4.0	23.0	0.0322	2.01	2.05
2c	16.0	4.0	24.0	0.0336	2.10	2.14
2d	15.9	4.1	23.5	0.0329	2.05	2.10
3a	16.4	3.6	26.0	0.0364	2.27	2.33
3b	16.0	4.0	26.6	0.0372	2.32	2.37
3c	16.0	4.0	26.5	0.0371	2.32	2.36
3d	16.2	3.8	26.0	0.0364	2.27	2.33
4a	15.9	4.1	24.5	0.0343	2.14	2.19
4b	16.0	4.0	25.0	0.0350	2.19	2.23
4c	15.9	4.1	25.5	0.0357	2.23	2.27
4d	15.8	4.2	26.0	0.0364	2.27	2.33
5a	16.0	4.0	25.3	0.0354	2.20	2.25
5b	15.8	4.2	25.0	0.0350	2.19	2.23
5c	15.8	4.2	25.9	0.0362	2.26	2.31
5d	15.6	4.4	25.5	0.0357	2.23	2.28
6a	15.7	4.3	24.5	0.0343	2.14	2.19
6b	15.9	4.1	25.0	0.0350	2.19	2.23
6c	16.2	3.8	24.3	0.0340	2.12	2.17
6d	15.8	4.2	25.5	0.0357	2.23	2.27

To establish the definite standard, it will of course be necessary to make a large number of comparative estimations, and that with officially standardized measures instead of ordinary laboratory glassware. Such work will be performed by the writers during the coming winter and it is hoped that other investigators will take up the same line of experiments; for if the ferric alum estimation is entirely feasible, it will prove vastly superior to the cumbersome and tedious Kjehldahl process now in vogue.

In conclusion, a few remarks as to methods of manipulation may be in place. The most convenient amount of reacting ingredients is 10 Cc. milk and 20 Cc. decinormal ferric alum solution (48.1 Gm. to the liter). This amount of ferric alum solution requires exactly 20 Cc. decinormal thiosulphate solution to decolorize the iodine liberated by it and the acid from the potassium iodide, and each cubic centimeter of thiosulphate solution less than twenty, required after combination with milk, means a cubic centimeter of ferric alum solution employed in precipitation.

The milk and ferric alum solution are mixed cold and it seems to make but little difference whether the milk be added to the ferric alum solution or *vice versa*. The mixture is allowed to stand 15 or 30 minutes and then filtered, and for this purpose a pledget of cotton in a glass funnel is found most satisfactory. If filter-paper is used, the iron creeps to the edge of the paper, from which it is washed with much difficulty. Pressure filtration was tried—to quicken process—but with results scarcely as satisfactory as filtration through cotton. At its best, the process of filtration is tedious, yet we have washed out precipitates in two hours, and a batch started in the afternoon may always be ready for titration the next morning.

In filtering, best results were obtained by throwing precipitate on filter in fairly concentrated liquid; that is, the total fluid need not measure more than 50 Cc. The distilled water used for washing the precipitate should be added before all of the preceding liquid has run through; for the drained precipitate becomes a firm mass, through which liquid passes with difficulty. The filtrate is usually free from iron when it measures 200 Cc. (at times it is iron-free when 150 Cc. have passed through), and either the total filtrate or an aliquot part can be titrated with thiosulphate solution. The titration is carried on as provided in the assay of ferric alum given in U. S. P., 1900.

In passing, it might be noted that the strength of ferric alum and thiosulphate solutions used in this work are based on the molecular weights of the U. S. P., 1890, since experiments were started before the appearance of our present standard.

In filtration, care must be taken that the liquid as it drops from the funnel is clear, and if it is cloudy, it must be returned until it does drop clear. Shortly after filtration, the liquid becomes slightly turbid, due undoubtedly to separated ferric albuminate. It was feared that the precipitate might be casein instead of ferric albuminate and thus prove a source

of error. That there was little danger of this, provided the filtrate was originally clear, seemed shown by the uniformity of figures in Tables I and II, but to settle the question, six samples of the same milk—a, b, c, d, e and f—were assayed. One set—a, c, and e—the original cloudy liquid was refiltered before titration; while their duplicates—b, d and f—were titrated in cloudy condition, with the following results:

TABLE III.

All with 20 Cc. decinormal ferric alum solution.

Milk sample.	Amount milk used.	Cc. decinormal thiosulphate required.	Cc. decinormal ferric alum used by milk.
a	5	18	2.0
b	5	18	2.0
c	10	16	4.0
d	10	16	4.0
e	20	12	8.0
f	20	12	8.0

As the results of titration in both cases were identical, the amount of separated substance must be insignificant.

Pharmaceutical Laboratory, Cleveland School of Pharmacy, August, 1905.

On motion of Mr. Chas. Caspari, Jr., the paper was received and referred for publication.

The Chair called for a paper by Mr. L. E. Sayre on gelsemium root, which, in the absence of the author, was presented in abstract by the General Secretary. The Chair stated that, without objection, the paper would take the usual course, and it was so ordered.

GELSEMIUM—A COMPARISON OF THE FRESH AND DRY ROOT AND RHIZOME.

BY L. E. SAYRE.

By way of introduction it may be stated that the medicinal plant representing Gelsemium, has been known by several common names as follows: Yellow Jessamine, Carolina Jessamine, Wild Woodbine, White Poison Vine and White Jessamine. The first of these, Yellow Jessamine, so firmly established, is apt to lead to confusion. Some few years ago I sent for some roots of the growing plant in the south. The plants sent to me, under cultivation, developed into a jessamine, not the true *Gelsemium sempervirens*. The term Gelsemium, as the name for the plant, has been under discussion among the Eclectics, but the term Gelsemium finds general acceptation and is, as is well known, the title given it by the U. S. P.

The medical as well as the botanical history of the plant has been fully treated in a monograph of recent date written by John Uri Lloyd and issued by Lloyd Brothers. (Drug Treatise No. IX, 1904.)

In this circular is mentioned the fact that "Gelsemium for a long time

remained an almost exclusive remedy of the Eclectic school, but in 1860 it attained a position in the U. S. Pharmacopœia, although not until 1880 did that work give any place to any preparation of Gelsemium." In this treatise it is also mentioned that its origin as a medicinal drug came through the mistake of a servant of a southern planter who was afflicted with fever. This servant by error gave his master a decoction of Gelsemium root, instead of the garden plant intended. "Immediate loss of muscular power and great depression followed, all control of the limbs was lost, the eyelids drooped and could not be voluntarily opened. Death seemed imminent. But the effects finally wore away and the man recovered free from fever, which did not recur." This circumstance led to a febrifuge preparation from the drug and the name of the drug was finally given to the profession.

The pharmacopœial description of the root and rhizome (the official parts) brings within the limits of a small space a satisfactory identification of the drug but does not bring out the fact that its virtues reside mainly in the bark—the wood being practically inert and tasteless. When green the bruised rhizome exhibits a peculiar honey-like odor. This almost entirely disappears on drying. It is stated by many physicians that the green drug possesses qualities altogether absent in the dry drug. In our physiological experiments we have been led to believe that the preparations of the fresh drug are more satisfactory as a motor depressant, but we have not noticed any qualities in the preparations of the green root foreign to that of the dry. From experiments performed in the laboratory of the university we are inclined to think that the tincture of the green root has a more decided action upon the heart. An equivalent quantity of tincture of the green and dried root and rhizome, each representing the same percentage strength of the oven-dry drug was employed. A student, who had an idiopathic heart hypertrophy, manifesting itself in excessive palpitation, was somewhat dependent upon Gelsemium preparations which were used by advice of physicians. This student desired to study the problem above referred to. His experiments were conducted under the care of physicians and the student was allowed to test the efficacy of the two preparations above noted. The facilities of the physiological laboratory were at his disposal. The result of this student's experiments cannot be given in detail, but these results confirmed the opinion that the green drug was more potent than the dried as a depressant. It is needless to say that for confirmation and for quantitative results, further experiments systematically conducted upon lower animals are necessary.

An alkaloidal assay of the dried root was made in 1897. The percentage of *gelsemine* and *gelsemic acid* was the subject of a paper contributed by the author and published in the American Journal of Pharmacy, 1897, page 234. During the years '04, '05, we have endeavored to ascertain the alkaloidal percentage of the green root and make comparison with

that of the dried. This has been done with the help of two specially trained students, Mr. F. R. Ireland and Mr. J. C. West.

It should be stated here that the analysis above referred to, of the dried root and rhizome, showed that 0.2 per cent. of alkaloid was found in the rhizome and 0.37 per cent. of *gelsemic acid*. Schmidt (1898) has shown the latter to be identical with beta-methyl-aesculetin, $C_9H_5(CH_3)O_4$, and suggests that the name of gelsemic acid be dropped. The root contained less alkaloid (0.17 per cent.). The difference in alkaloidal proportion, however, may be accounted for in bark relationship, all of the alkaloid being found in the bark. The bark relation to the wood in the rhizome and root would probably account for this difference in proportion. It was found also that the stem of the vine contained neither alkaloid nor acid.

We should say in passing that it is probable that the alkaloid *gelsemine* is composed of two alkaloids. Our experiments recently lead us to this conclusion. It has been so stated by Thompson (1887). He called one of them *gelsemine*, the other *gelseminine* and this was confirmed by Cushny. We have made no attempts to separate and purify these, both being soluble in chloroform, and extracted by the process we have employed in analyses. Sonnenschein and Robbins (1876) gave the ultimate composition of the alkaloid as $C_{11}H_{19}NO_2$. Gerrard (1893) gave it as $C_{12}H_{14}NO_2$. The mixture of alkaloids is bitter, colorless and odorless; soluble in chloroform, ether, acetic ether, acetone and amylic alcohol. Almost insoluble in water, insoluble in petroleum-ether. One of the alkaloids in the mixture we have found to be more soluble in dilute acids than the other, and we are inclined to the opinion that they may be separated by taking advantage of this property.

For the work of the past two years we are indebted for the supply of material to Professor J. U. Lloyd. Through him we received an adequate supply of the fresh drug preserved in alcohol. The material was disintegrated, and after covering with alcohol was packed, and hermetically sealed, in a glass jar. This material was macerated in a larger quantity of alcohol for nearly two months. Then the liquid was decanted and the drug itself carefully packed in a percolator. The decanted tincture was first percolated through the drug, followed with alcohol, until the fibrous material was exhausted. The tinctures were mixed and transferred to tight receptacles. An aliquot portion of this tincture was evaporated spontaneously to dryness and the residue thoroughly extracted with water acidulated with sulphuric acid. The acid liquid was then treated with chloroform, in a separator, in order to remove the fluorescent principle or so-called gelsemic acid. To thoroughly remove this is rather tedious as it requires a number of washings. To make sure that all of it has been separated, a few drops of the last chloroformic washing were evaporated to dryness and dissolved in a weak alkaline solution. The substance is readily recognized here, if present, by its peculiar fluorescent properties.

The solution is bright yellow in transmitted light. In reflected light the fluorescence is so delicate, it is stated, that 1 part in 1,500,000 parts will exhibit this bluish fluorescence.

After taking out the so-called gelsemic acid from acid solution with chloroform, the acid solution was made alkaline with solution of sodium hydroxide and again shaken out with chloroform, in several portions, until all the alkaloid was removed, or until the washings no longer gave alkaloidal reaction. Upon evaporating the chloroform it was found that coloring matter was present. To remove this, repeated solution in very dilute hydrochloric acid, neutralization with alkali and shaking with chloroform was necessary. The coloring matter was finally removed and the chloroform evaporated. The residue heated to a constant weight was taken as the weight of the alkaloid. This residue answered to the usual alkaloidal reagents and gave with acids crystalline salts. It was found soluble in the various solvents above stated. From the green root and rhizome, we obtained from six analyses an average of 0.265 per cent. The percentage was calculated on the basis of the oven-dry drug. We have repeatedly examined the dried root and rhizome and our percentage of alkaloidal strength seldom gave beyond the 0.2 per cent. As a fair average we would say that 0.2 per cent. was rather high. We are of the opinion therefore that the drug in drying loses in physiological strength. To prove this however, it would be necessary to have the drug specially collected, one sample being dried, and another, exactly from the same lot, preserved in alcohol and both run through the assay as above described. This we hope to do in the future.

University of Kansas, Lawrence, Kansas.

The Chair called on Mr. W. A. Puckner to present in abstract a series of three papers he had prepared on caffeine and acetanilid, and he did so, receiving the applause of his auditors:

NOTES ON THE ESTIMATION OF CAFFEINE.

W. A. PUCKNER.

From experiments carried out in his laboratory, Allen (Allen's Commercial Organic Analysis, Vol. III., Part II., p. 375) concludes that from a solution of caffeine the solvent, be it water, alcohol, ether or chloroform, may be evaporated off without loss of caffeine; that the residue, if dried at 100°, is completely dehydrated, and that prolonged drying in an open dish in a water-oven at 100° entails no material loss of caffeine. Further, it was shown that caffeine becomes anhydrous if dried over sulphuric acid at ordinary temperature. That a trace of caffeine does volatilize when dried at the temperature of boiling water was shown, and to such volatilization was ascribed the loss which was noted when caffeine, after long exposure over sulphuric acid at 20°, was subsequently dried in a water-oven for a long time.

Because of this possible loss of caffeine at elevated temperatures, and because G. L. Spencer (J. Am. Chem. Soc., 19, 279) found that in the recovery of chloroform by distillation loss of caffeine may occur from "entrainment of caffeine with chloroform vapors," it has been my custom to avoid the use of heat as much as possible. When in the estimation of caffeine this has been extracted with chloroform, instead of distilling off the solvent and drying the residual caffeine at a temperature at or near 100°, I have allowed the chloroform to evaporate at room temperature and dried the residue over sulphuric acid, or else I have evaporated off the chloroform at about 55° and then brought the residue to constant weight either at this temperature or else at 95°. The results so obtained did at times not agree with those obtained when the chloroform was distilled and the residue dried at the temperature of boiling water, and led me to suspect that either an appreciable loss of caffeine occurred when it is dried at 95–100° or else that water, or perhaps chloroform * was retained when dried over sulphuric acid at ordinary temperature. To determine favorable conditions under which caffeine may be dried without loss of substance a series of experiments were made which, while not entirely satisfactory,† yet permit the following conclusions:

* Caffeine, when being dried, is peculiarly liable to decrepitate, and this has been taken to indicate that some of the solvent is mechanically retained and often directions are given, after the chloroform has been distilled off, to moisten the residual caffeine with ether, as, for instance, in the pharmacopœial method for the valuation of guarana.

Decrepitation is liable to occur whenever caffeine is dried at a temperature higher than that at which the chloroform was driven off. Thus it occurs if the chloroform is allowed to evaporate at room temperature and the residue then dried at 60 or 100 degrees, even if previously it has been kept over sulphuric acid for many days. Estimations have been spoiled when the chloroform was evaporated by placing the dish *on* an oven registering 55 degrees inside and placing the dish *in* the oven when the solvent has evaporated; while, if evaporated at 55 degrees and dried at the same temperature, no decrepitation took place. When the chloroform is distilled off slowly from a water-bath, and care taken that it is completely expelled, no decrepitation occurs when it is then placed in an oven registering 95–100 degrees.

If retained chloroform really is the cause of the decrepitation, the amount must be small, since when adding ether or alcohol to such dry residues and again bringing to constant weight practically the original weight was again found, thus caffeine residues, obtained by evaporating the chloroform and drying to constant weight at 55 to 60 degrees, weighing (a) .1001 Gm., (b) .0988 Gm., (c) .1001 Gm., when dissolved in alcohol and again dried to constant weight at 55 to 60 degrees weighed (a) .0999 Gm., (b) .1001 Gm., (c) .1001 Gm. Further, when an aqueous solution of caffeine was evaporated in a desiccator over sulphuric acid, and after renewing the drying material kept there for many days until the weight of the residue remained constant, loss by decrepitation occurred when it was submitted to a temperature of 55 degrees.

† While the extraction of caffeine from aqueous solution is not as difficult as was claimed by Gomberg (J. Am. Chem. Soc.. 1886, vol. 18, p. 338, 978), yet the fact remains that relatively large quantities of chloroform must be used; this entails the use of rather large vessels, the tare of which is liable to considerable variation with changes of atmospheric conditions. To avoid errors of this kind, vessels of nearly the same size, shape

When an aqueous or chloroformic solution of caffeine is exposed to air at ordinary temperature until the solvent has disappeared and the residue kept in a desiccator containing sulphuric acid, its weight finally becomes constant and then approximately corresponds to the weight of caffeine dried thoroughly at 95° taken * or at least does not exceed this weight by 0.3 %.†

and weight as that containing the chloroform were in each case used as counterpoises, so that the weights on the pan never exceeded 1 Gm.

Unless it be proven that the chloroform leaves no residue, a considerable error may be introduced in this way, 100 Cc. of a lot of the chloroform which responded favorably to all tests of the U. S. Pharmacopœia (U. S. P. 8), when distilled slowly from a water-bath, left a residue which when dried at 95 degrees weighed .0008 Gm.; waste chloroform, *i. e.*, chloroform recovered from drug assays was shaken with dilute sulphuric acid, then with dry sodium carbonate and distilled slowly; 100 Cc. of this when again distilled left a residue weighing when dry .0012 Gm.

When extracting aqueous solutions with chloroform, it is convenient when drawing it off, to pass it through a pledget of cotton, which retains any drops of aqueous fluid which may be carried out of the separator. But, unless it is proven that the cotton contains nothing which is soluble in chloroform, an error may here be introduced, thus, when 0.1 Gm. of a certain "absorbent cotton" was placed in a funnel, and 50 Cc. chloroform percolated through it, this when distilled left a residue which, when dried at 95 degrees weighed 0.0012 Gm. Finding it difficult to completely exhaust cotton from chloroform-soluble matter, asbestos was used as a filtering medium in the following experiments.

* The caffeine used in these experiments was obtained from a well-known manufacturer, and was re-crystallized from hot water six times, then dried first at 55 degrees for 10 days, and then at 95 for two days. While it is generally accepted that under these conditions anhydrous caffeine is obtained, and while Allen's work apparently confirms this, E. Tassily (Bull. Soc. Chim. Paris [3] 17, p. 576) finds that anhydrous caffeine is not even obtained though the temperature be raised to 150 degrees. While theoretically caffeine, $C_8H_{10}O_2N_4$=194.24, contains 28.91 per cent. nitrogen, he found 27.9 per cent. in caffeine dried at 110 degrees and 28.30 per cent. when dried at 150 degrees, and therefore concluded that water was still retained. Dr. Max B. Slimmer, of Chicago, kindly offered to estimate the nitrogen content of the caffeine dried as just described and found 28.27 per cent. and 28.38 per cent., thus apparently confirming Tasilly's results.

As another proof that anhydrous caffeine cannot be obtained by drying, Tasilly states that crystallized caffeine, the nitrogen content of which closely agreed with that required by theory for $C_8H_{10}O_2N_4 + H_2O$. when dried at 110°, lost only 6.93 per cent., while it should have lost 8.49 per cent. This also agrees with my experiments; thus the specimen of caffeine above described, when dried to constant weight at 55 degrees, lost 6.96 per cent. But while, according to Tasilly, the per cent. of water retained depends on the temperature, my experiments, detailed in the following, indicate that if not anhydrous caffeine, then a definite hydrate is obtained regardless of the temperature which is employed in drying it as long as loss by vaporization is guarded against, and whether the solvent be water or chloroform.

†a) The following experiments are taken to show that caffeine can be dried to definite weight or ordinary temperature, and that this weight agrees with that obtained when dried at higher temperatures.

Crystallized caffeine, dried over sulphuric acid at 20–25 degrees until its weight was constant, weighed 2.0169 Gm., and this weight was unchanged when it was then exposed to a temperature of 55 degrees during three days.

b) Caffeine, purified by repeated crystallization from hot water and then dried at 95

The time required until the weight becomes constant will of course depend on the shape of the vessel containing the caffeine solution, the arrangement of the drying agent and the form in which the caffeine separates out, but it usually precludes the use of this procedure for analytical purposes.

When from a chloroform solution of caffeine the solvent, contained in a shallow dish, is permitted to evaporate at a temperature of about 55 degrees, *i. e.*, below the boiling-points of chloroform, and the residue dried at the same temperature, its weight becomes practically constant in five to ten hours, and corresponds to the weight of caffeine, dried at 95°, taken. While at this temperature loss of caffeine through volatilization may be demonstrated, and while this loss varies with the conditions of the experiment, it will rarely exceed 0.0001 Gm. in 24 hours.*

From a solution of caffeine in chloroform contained in a flask, the solvent may be distilled off without loss of caffeine. If the residue is then dried out at 95–100°, its weight becomes practically constant in two to five hours. While loss of caffeine through vaporization may be demonstrated, and while its rate varies with the conditions of the experiment, it will rarely exceed 0.0001 Gm. in 24 hours. On the other hand, if a chloroform solution of caffeine is allowed to evaporate in a shallow, flat-bottomed dish, and the residue is then dried at 95°, loss of caffeine through volatilization can readily be shown, and at times a loss of .003–.005 Gm. in 24 hours may be incurred.†

degrees for several days, was dissolved in water, so that 100 Gm. of the solution contained 1 Gm. of this dried caffeine. Portions of about 10 Cc. were weighed out and kept over sulphuric acid until dry, the acid in the desiccator then changed, and the drying continued until the weight of the residue became constant. Calculated from the weight of dry caffeine taken, the results indicated 100.1 per cent., 100.0 per cent., 100.2 per cent.

c) Caffeine, dried at 95° for several days, and weighing 1.1931 Gm., was dissolved in 50 Cc. chloroform, the solvent evaporated at room temperature, and the residue placed in a desiccator with (over and under) sulphuric acid. The weight of the residue became constant after four days, and was 1.1966 Gm., or 100.3 per cent.

* a) When hydrous caffeine was dried over sulphuric acid until its weight became constant, no further loss of weight could be detected when it was then kept at 55° for 48 hours.

b) 1.7413 Gm. caffeine, dried at 95 degrees, was dissolved in chloroform, then the solvent evaporated off at 55°, and the residue dried in an oven at the same temperature. After 24 hours it weighed 1.7446, or 100.2 per cent., and, after six days, having lost about 0.0003 Gm. per day, it weighed 1.7429, or 100.1 per cent.

c) When in caffeine estimations 0.1 Gm. caffeine was extracted from aqueous solutions with 50 Cc. chloroform, and this in a shallow beaker, evaporated at about 55°, then its weight became practically constant when dried in an oven at 55 degrees for five hours, losing not more than .001 Gm. when kept at this temperature for two or three days.

† a) Caffeine, contained in a narrow-mouthed flask having a capacity of about 120 Cc., dried at about 95 degrees for three days, weighed .3109 Gm. It was dissolved in 100 Cc. chloroform, the solvent distilled off slowly, and the residue then dried at 95 degrees. After two hours it weighed .3110 Gm., after three hours .3109; the weight now remained practically constant, and having been exposed to this temperature during 48 hours, the

While when recovering caffeine from a chloroformic solution, equally correct results are obtained when the chloroform is evaporated from a shallow dish at about 50–60° and drying the residue at the same temperature for 12–24 hours, or when the chloroform is distilled off and the residue dried at 95–100°, the latter procedure is to be preferred because less time is required to complete the estimation. Where many such estimations are made the decreased cost because of the recovery of the chloroform is also to be considered. If the chloroform is distilled from a water-bath slowly and in such a way that active ebullition does not occur and is carried to complete dryness, then decrepitation will not occur.

THE ESTIMATION OF ACETANILIDE.

BY W. A. PUCKNER.

Being called upon to estimate acentanilide and caffeine in certain headache remedies the extraction of both acetanilide and caffeine from acid solution by means of ether or chloroform and the subsequent precipitation of caffeine as periodide suggested itself. But, while no difficulty was anticipated in their separation from other constituents liable to be present by extracting from a sulphuric acid solution with chloroform, it seemed desirable to make some experiments relative to the temperature at which the solvent may be expelled and the residue obtained in condition for weighing.

Acetanilide was purified by repeatedly allowing it to separate from its solution in hot water and finally drying it in a warm place.

(a) Over sulphuric acid its weight was practically constant, 5.3636 Gm.

residue still weighed .3108 Gm. That caffeine is volatile at this temperature was shown by the formation of a crystalline film in the upper part of the flask, and when a slow current of air was drawn through the flask, still kept at 95 degrees, a loss of .0015 Gm. took place in five hours and a deposit of caffeine could plainly be seen in the glass tube through which the air was drawn where it projected from the oven.

b) Caffeine contained in a 60 Cc. Erlenmeyer flask and keep in a small drying oven at 95 degrees over 24 hours weighed 3.4519 Gm. This drying was then continued for six days; during this time an almost constant loss of .0002 Gm. for 24 hours was noted, and at the end the weight was 3.4507, or a loss of 0.4 per cent. in six days.

c) A chloroformic solution of caffeine was distilled to complete dryness in a water-bath, and then dried in an oven at 95 degrees. After being dried for one hour the residue weighed .1008 Gm., after two hours., .1003 Gm., after three hours .1002 Gm.; the weight then became constant and after twenty-four hours the residue weighed .1001 Gm. In a similar experiment the weight became practically constant after two hours, then retained at 95 degrees for two days, a loss of .0006 Gm. took place.

d) When on the other hand the chloroformic solution of caffeine was contained in a shallow beaker, and after evaporation the residue dried at 95 degrees, then a loss of .0020 to .0050 Gm. in twenty-four hours was incurred. The rate at which this loss occurred was of course not in proportion to the weight of caffeine, but rather to the surface exposed, etc., thus when about 2 Gm. caffeine were dried, a loss of .0038 in twenty-four hours was noted, and later, when less than .1000 Gm. caffeine was continued in the same flat dish, loss of caffeine took place at the rate of .0040 Gm., or 4 per cent. in twenty-four hours.

losing in seven days but .0004 Gm. Dried in a weighing bottle at 55°, 2.6960 Gm. showed after 85 hours a loss of .0006 Gm. or .02 per cent. Dried at 95° during 24 hours, 1.3430 Gm. lost .0111 Gm. or .83 per cent.

(b) To 1.0108 Gm. acetanilide, contained in a separator, was added 20 Cc. tenth-normal sulphuric acid (acetanilide being appreciably hydrolysed by water, it must be extracted from acid solutions) and then extracted with four portions of chloroform, 20 Cc. each (a fifth 20 Cc. extracted 0.0002 Gm.). The extractions were successively passed through asbestos into a shallow beaker and the chloroform evaporated at a temperature of 25–30° and the residue brought to constant weight over sulphuric acid. The results are:

Acetanilide taken						1.0108 Gm.		
After 5 hours, over sulphuric acid, the residue weighed						1.0138 Gm., or		100.30%
" 24	"	"	"	"	"	1.0133	"	100.25%
" 48	"	"	"	"	"	1.0127	"	100.19%
" 8 days	"	"	"	"	"	1.0123	"	100.15%

(c) To determine if better results could be obtained if the addition of water and acid is omitted and the acetanilide is extracted from the dry mixture, as is feasible in most acetanilide separations, a weighed quantity of acetanilide was dissolved in 50 Cc. chloroform, this evaporated at room temperature and the residue dried over sulphuric acid.

Acetanilide taken						.5453 Gm.		
The residue dried over sulphuric acid during				one day, weighed		.5467 Gm., or		100.26%
"	"	"	"	two days	"	.5467	"	100.26%
"	"	"	"	three "	"	.5465	"	100.22%
"	"	"	"	six "	"	.5464	"	100.20%
"	"	"	"	nine "	"	.5462	"	100.16%

(d) To 1.0597 Gm. acetanilide, contained in a separator, was added 20 Cc. tenth-normal sulphuric acid, then extracted with five portions of chloroform, 20 Cc. each, the chloroform passed through asbestos into a flask and then the solvent distilled off slowly. When liquid ceased to pass over, the flask was removed from the bath, rotated slowly until crystallization set in and the acetanilide suddenly congealed on the sides of the flask, and then dried, first at 55°, then at 95°.

Acetanilide taken						1.0597 Gm.		
After 5 hours at 55° the residue weighed					.....	1.0646 Gm., or		100.46%
" 17	"	"	"	"	.....	1.0637	"	100.38%
" 24	"	"	"	"	.....	1.0631	"	100.32%
" 48	"	"	"	"	.....	1.0625	"	100.26%
Then 24 hours at 95°					.....	1.0502	"	99.10%

At 55°, as well as at 95°, sublimation of acetanilide toward the upper portion of the flask was plainly seen.

(e) Proceeding as in (d), but substituting the same volume of *normal* sulphuric acid for the tenth-normal solution there used, it was shown that

five portions of chloroform, 20 Cc. each, here also was sufficient to extract the acetanilide quantitatively; the residue after 12 hours amounted to 100.27 per cent., and after 24 hours to 100.14 per cent.

(f) Proceeding as in (d), except that the residue was at once dried at 95°, the results were:

Acetanilide taken								1.0476 Gm.	
The residue, dried in an oven at 95° during	1	hour,	weighed					1.0666 Gm, or	101.81%
"	"	"	"	2	hours,	"		1.0477 "	100.01%
"	"	"	"	3	"	"		1.0472 "	99.96%
"	"	"	"	4	"	"		1.0467 "	99.91%
"	"	"	"	5	"	"		1.0463 "	99.87%
"	"	"	"	6	"	"		1.0458 "	99.83%

An exact duplicate gave:

Acetanilide taken ..... 1.0004 Gm.

The residue dried during respectively 1, 2, 3 and 4 hours weighed 1.0128 Gm., 1.0001 Gm., .9998 Gm., .9991 Gm., corresponding to 101.24 per cent., 99.97 per cent., 99.94 per cent., 99.87 per cent.

At the same time that the second determination was made another one was carried out exactly like it, except that while in the previous two determinations the internal diameter of the neck of the flask used was 15 Mm. the neck of the flask used in this determination had a diameter of 25 Mm. The results plainly show how the wider neck facilitated diffusion of the vapors in the flask, and thereby increased the speed with which acetanilide vaporized.

Acetanilide taken								.9888 Gm.	
The residue dried at 95° during	1	hour	weighed	.....				.9885 Gm., or	99.79%
"	"	"	"	2	hours	"	.....	.9867 "	99.78%
"	"	"	"	3	"	"	.....	.9864 "	99.76%
"	"	"	"	4	"	"	.....	.9823 "	99.53%

(g) To determine whether better results could be obtained with ether as a solvent, about 5 Gm. was treated with 20 Cc. tenth-normal sulphuric acid and extracted with 20, 20, 10, 10, 10, 10 Cc. U. S. ether (a further 10 and 10 Cc. ether still extracted .0006 Gm.), the ether evaporated in a warm place, protected from air-currents to avoid condensation of moisture, and the residue dried over sulphuric acid. The results:

Acetanilide taken								.5380 Gm.	
After 1 day, over sulphuric acid, the residue weighed							....	.5421 Gm., or	100.76%
" 3 days,	"	"	"	"	"	....	.5409	"	100.54%
" 5 "	"	"	"	"	"	....	.5405	"	100.46%
" 10 "	"	"	"	"	"	....	.5403	"	100.43%

(h) To .5116 Gm. acetanilid was added 20 Cc. tenth-normal sulphuric acid and then extracted with 40, 10, 10, 10, 10, 10, 10 Cc. ether, U. S.

(further 10 and 10 Cc. ether still extracted .0008 Gm.), the ether distilled off and the residue dried at 55°.

Acetanilide taken							.5116 Gm.		
The residue dried at 55° during			1	day	weighed	.....	.5160 Gm.,	or	100.86%
"	"	"	2	days	"	.....	.5125	"	100.17%
"	"	"	3	"	"	.....	.5119	"	100.06%
"	"	"	4	"	"	.....	.5117	"	100.02%
"	"	"	5	"	"	.....	.5115	"	99.98%
"	"	"	10	"	"	.....	.5106	"	99.80%

These experiments show that acetanilide is quite volatile at comparatively low temperature. From its ether or chloroform solution the solvent may be evaporated at room temperature and the residue brought to constant weight over sulphuric acid without loss of substance. If the solvent is distilled from a flask and the residue dried at 50–60°, the loss by volatilization. is slight, and practically constant weight is attained in 12–24 hours. At 95° acetanilide is appreciably volatile, even when contained in a narrow-necked flask. The residue obtained when the solvent is driven off from an ether or chloroform solution of acetanilid is not pure acetanilid, and if loss by volatilization is guarded against high results are invariably obtained. Through a compensation of error fairly correct results are obtained if after the chloroform has been distilled off the flask is rotated until crystallization sets in and the residue is then dried at about 95° during two hours.

THE ESTIMATION OF CAFFEINE IN PRESENCE OF ACETANILIDE.

W. A. PUCKNER.

In the estimation of caffeine in headache remedies containing acetanilide, the extraction of both caffeine and acetanilide by means of chloroform and the estimations of caffeine in the residue left on evaporation of the chloroform, by precipitation as periodide as proposed by Gomberg* suggested itself.

Since in these mixtures the acetanilide is present in comparatively large amounts, either a very large volume of water must be used to dissolve the chloroform residue, or else a partial separation of caffeine from acetanilide may be based upon the slight solubility in water of the latter constituent. A series of determinations were made to determine which of these procedures was to be preferred, and also to study the effect of acetanilide on the periodide precipitation, Gomberg having found that acetic acid interferes seriously. Because it has been found that the composition of the periodides of the alkaloids depends upon the dilution, excess of free acid, free iodine, etc.,† and also so as to avoid the errors incidental to volu-

* J. Am. Chem. Soc., 1896, vol. 18, p. 338.

† Kippenberger, Z. anal. Chem., 1896, vol. 35, p. 462, and 1900, vol. 39, p. 435.

metric determinations, instead of the residual iodine titration proposed by Gomberg, the periodide was collected, decomposed with sodium sulphite and the caffeine extracted with chloroform.

The caffeine solution used in these experiments was prepared by dissolving caffeine, purified by repeated crystallization from hot water, and then dried for several days at 95°, in water so as to obtain a solution containing one per cent. by weight of dry caffeine.*

After some preliminary experiments † the following procedure for the estimation of caffeine was adopted: The caffeine solution, containing not much more than .1 Gm. caffeine and measuring about 25 Cc., rendered alkaline with ammonia water if acid in reaction and contained in a separator is shaken out with five portions of chloroform, 10 Cc. each and the

* Until Tasilly's conclusions referred to in another paper: Notes on the Estimation of Caffeine, Proc. A. Ph. A., 1905, vol. 53, p. 285, have been disproven, I refrain from designating caffeine, dried at 95°, as "anhydrous" caffeine.

† The following determinations show that moderate quantities of acid or alkali will not affect the estimation of caffeine as given below:

(a) 10 Cc. of a caffeine solution of unknown strength were weighed, transferred to a separator with 14 Cc. water and 1 Cc. 10 per cent. ammonia water and extracted with five portions of chloroform, 10 Cc. each, drawn through a pledget of asbestos into a shallow dish. The solvent was evaporated at 50–60°, and the residue dried to constant weight at the same temperature. The results indicated the solution to contain: .9976 per cent., .9973 per cent., .9943 per cent., .9940 per cent., .9945 per cent., or an average of .9955 per cent. dry caffeine.

Proceeding as in *a*, except that the chloroform was drawn into a small flask, distilled slowly from a water-bath, the residue dried during three hours at 95°. The results are: .9974 per cent., .9951 per cent., .9957 per cent., average .9953 per cent.

(c) Proceeding as in *b*, except that 15 Cc. 10 per cent. ammonia water was used to transfer the caffeine solution, the results were: .9975 per cent., .9952 per cent., average .9964 per cent.

(d) Proceeding as in *b*, except using 2.5 Cc. normal sodium hydroxide V. S. and 12.5 Cc. water, the liquid from which the caffeine was extracted therefore was tenth-normal as regards sodium hydroxide. The result was: .9962 per cent.

(e) When proceeding as in *b*, except that 12.5 Cc. normal sodium hydroxide V. S. and 2.5 Cc. water was used, and the liquid therefore was a half-normal sodium hydroxide V. S., the result indicated .9885 per cent.

(f) Again as in *b*, except that the solution was normal as to sodium hydroxide, the result was .9826 per cent.

(g) As *b*, except that 2.5 Cc. normal sulphuric acid V. S. and 12.5 Cc. water was used, and the caffeine was therefore extracted from a tenth-normal sulphuric acid solution. The results were: .9950 per cent., .9965 per cent.; average .9958 per cent.

(h) As *b*, except that the caffeine was extracted from a half-normal sulphuric acid solution, the results were: .9920 per cent., .9958 per cent.; average .9939 per cent.

(i) As *b*, except that the caffeine solution is mixed with a solution of 1 Gm. dried sodium sulphite, 1 Gm. sodium sulphate, dry, 1 Gm. sodium iodide in 15 Cc. water. The results were: .9957 per cent., 9969 per cent.; average .9963 per cent.

(j) As *i*, except that the salts were dissolved in 5 Cc. ammonia water and 10 Cc. water. The results are: .9978 per cent., .9974 per cent., 9976 per cent.; average .9973 per cent.

extractions passed through a little asbestos into a small Erlenmeyer flask. The solvent is distilled from a water-bath slowly and in such a way that active ebullition does not occur. When the residue is perfectly dry the flask is placed in a drying oven, kept at 95–100°, during three hours.*

Weighing portions of 10 Cc. of the caffeine solution and transferring it to the separator with 14 Cc. water and 1 Cc. ammonia water, the results were :

Solution taken : 9.975 Gm., 9.981 Gm., 9.986 Gm., 9.980 Gm., 9.970 Gm., 9.986 Gm., 9.982 Gm.

Representing dry caffeine : .0998 Gm., .0998 Gm., .0999 Gm., .0998 Gm., .0997 Gm., .0999 Gm., .0998 Gm.

Dry caffeine found : .0995 Gm., .0995 Gm., .0998 Gm., .0994 Gm., .0996 Gm., .0996 Gm., .0997 Gm.

Per cent. of dry caffeine indicated : 99.8 per cent., 99.8 per cent., 99.9 per cent., 99.6 per cent., 99.9 per cent., 99.9 per cent., 99.7 per cent. Average, 99.8 per cent.

After some experiments relative to the effect of dilution and acidity,†

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* For reasons given, Proc. A. Ph. A., 1905, vol. 53, p. 286, foot-note 3, a flask similar in size and weight was used as a counterpoise. It was also determined that the chloroform used left no residue on evaporation.

† Weighing 10 Cc. of caffeine solution which had been found, see footnote 5, b, to contain .995 per cent. caffeine and carrying out the precipitation in varying dilutions and adding varying amounts of hydrochloric acid the following results were obtained :

(a) The caffeine solution was diluted to 25 Cc., 0.25 Cc. hydrochloric acid U. S., and then 50 Cc. tenth-normal iodine solution added and then the caffeine in the periodide precipitate determined. Calculated from the weight of caffeine found, the strength of the solution was .988 per cent.

(b) Procedure as *a*, except that .75 Cc. hydrochloric acid was added.

Found : .992 per cent., .994 per cent., .993 per cent., .993 per cent.; average, .993 per cent.

(c) As a, except that 2.25 Cc. hydrochloric acid was used.

Found : .997 per cent., .994 per cent., .991 per cent., .996 per cent., .997 per cent. .992 per cent., .996 per cent.; average, .995 per cent.

(d) The caffeine solution was diluted to 200 Cc., then 2.5 Cc. hydrochloric acid and 50 Cc. tenth-normal iodine solution added.

Found : .972 per cent.

(e) As *d*, except that 7.5 Cc. hydrochloric acid was added.

Found : .974 per cent.

(f) The caffeine solution was diluted to 200 Cc., 4 Cc. hydrochloric acid and 200 Cc. tenth-normal iodine added.

Found : .983 per cent.

(g) The caffeine solution diluted to 50 Cc., 1 Cc. hydrochloric acid and 50 Cc. tenth-normal iodine added.

Found : .992 per cent., .993 per cent., .993 per cent; average, .993 per cent.

While, when in *e*, the precipitation occurred in a liquid containing 3 per cent. by volume of hydrochloric acid, U. S. P., the result, .995 per cent., corresponds to that found in the direct estimation, when in *b* and *e* but 1 per cent. by volume was present, .993 per cent. was found, yet the smaller quantity of acid was adopted for future work

the following procedure for the precipitation of caffeine periodide was adopted: To the measuring about 50 Cc. and containing not much more than 1 Gm. caffeine, 1 Cc. hydrochloric acid U. S. P., and then 50 Cc. approximately tenth-normal iodine solution is added and the mixture rotated occasionally during one-half hour. The clear supernatant liquid is then decanted to a small funnel, provided with a small, loosely-packed asbestos plug; finally the precipitate is transferred and the flask, funnel and precipitate washed with 25 Cc. tenth-normal iodine solution to which has been added .25 Cc., or five drops, of hydrochloric acid, U. S. When the liquid has drained the funnel is placed in the neck of a separator, 2 Gm. sodium sulphite and 10 Cc. water are introduced into the flask used for the precipitation, the adhering precipitate dissolved and the solution then poured in portions on the precipitate in the funnel, stirring gently the precipitate with a rod to facilitate solution. Next the flask and funnel are washed with several small portions of water, using about 15 Cc. in all, and then the caffeine determined as described above.

Estimation of caffeine in the one per cent. solution described above gave:

Solution taken: 9.995 Gm., 9.988 Gm., 9.992 Gm, 9.995 Gm., 9.994 Gm., 9.981 Gm., 9.987 Gm., 4.819 Gm., 6.570 Gm., 3.951 Gm., 6.192 Gm., 5.051 Gm., 5.106 Gm.

Representing dry caffeine: .1000 Gm., .0999 Gm., .0999 Gm., .1000 Gm., .0999 Gm., .0998 Gm., .0999 Gm., .0482 Gm., .0652 Gm., 0.392 Gm., .0614 Gm., .0501 Gm., .0504 Gm.

Dry caffeine found: .0997 Gm., .0992 Gm., .0992 Gm., .0997 Gm., .0993 Gm., .0899 Gm., .0993 Gm., .0476 Gm., .0652 Gm., .0392 Gm., .0614 Gm., .0501 Gm., .0504 Gm.

Per cent. indicated: 99.7 per cent., 99.3 per cent., 99.3 per cent., 99.7 per cent., 99.4 per cent., 99.1 per cent., 99.4 per cent., 98.8 per cent., 99.2 per cent., 99.2 per cent., 99.2 per cent., 99.2 per cent., 98.7 per cent.; average, 99.3 per cent.

It having been shown that dilution materially affects the separation of caffeine as periodide, the complete solution of the acetanilid-caffeine mixture was not attempted. Instead the residue consisting of acetanilid and caffeine, obtained by extracting with chloroform and distilling the solvent, was dissolved in hot water, the solution allowed to cool, and when the larger part of the acetanilid had again separated out, the liquid filtered, the residue washed with cold water and in the filtrate the caffeine precipitated and estimated as before outlined. Using about 1 Gm. acetanilid and weighed portions of the caffeine solution, representing

because more concordant results were thus obtained, and because the caffeine isolated when the larger volume of acid had been used on several occasions was not completely soluble in water, and hence impure.

about .1 Gm. caffeine, the caffeine so isolated represented: 98.0 per cent., 98.7 per cent., 97.4 per cent., 98.4 per cent., 99.1 per cent., 97.9 per cent.; average, 98.2 per cent.

It was shown that the loss of nearly two per cent. of the caffeine was not because of the solubility of caffeine periodide in acetanilid,* nor was evidence had that it was because of caffeine held back in the acetanilid which crystallized out.†

When the acetanilide-caffeine residue was dissolved in 50 Cc. hot water, filtered when cool, the flask and filter washed with 25 Cc. water, 1 Cc. hydrochloric acid, U. S., added and then 25 Cc. fifth-normal iodine solution ‡ added, somewhat better results were obtained. Thus, using 1 Gm. acetanilide and weighed quantities of caffeine solution, representing about .1 Gm. caffeine, then the caffeine so recovered represented 99.3 per cent., 99.1 per cent., 98.3 per cent., 98.5 per cent., 98.7 per cent., 99.0 per cent., 98.5 per cent., 98.2 per cent., or an average of 98.7 per cent. Below are given a series of determinations of acetanilide and caffeine in which this procedure was employed, thus: To the acetanilide contained in a separator, was added a weighed portion of the caffeine solution, 2 Cc. normal sulphuric acid § and sufficient water to make the total volume about 20 Cc. This is then extracted with five portions of chloroform, 20 Cc. each, and the extractions, passed through asbestos, received in a flask. The chloroform is distilled slowly from a water-bath and when it ceases to pass over, the flask is detached, rotated until crystallization sets in and then either dried at 50–60° during 12–24 hours (a) or else at 95–100° during two hours (b) and weighed. Then 50 Cc. water is added to

* When weighed portions of caffeine solution, representing about .1 Gm. caffeine, were diluted with 80 Cc. water, 1 Cc. hydrochloric acid added, then half-normal iodine solution, 99.2 per cent., 99.7 per cent., 99.7 per cent., 99.4 per cent.; average, 99.4 per cent. of the caffeine was recovered. When instead of 80 Cc. water, 80 Cc. of a saturated solution of acetanilid was added, then the results were 98.8 per cent., 99.3 per cent., 99.4 per cent., 99.4 per cent., 99.6 per cent.; average, 99.3 per cent.

† When the acetanilide remaining in the funnel was washed with a little water, the washing remained clear when hydrochloric acid and iodine were added. When the acetanilide was dissolved in hot water, the solution cooled and filtered, no precipitation occurred when hydrochloric acid and iodine were added.

‡ Attempts to decrease the total volume of the liquid in which the periodide precipitation is made, suggested the use of a more concentrated iodine solution. It was found that a clear solution resulted when 90 Cc. of a saturated solution of acetanilid was acidulated with 1 Cc. hydrochloric acid and then 10 Cc. of an approximately half-normal iodine solution, 63 Gm. iodine and 90 Gm. potassium iodide in 1000 Cc. was added. But, if the volume of either the iodine solution or the hydrochloric acid was materially increased then precipitation took place. When a fifth-normal iodine solution was used no precipitation occurred even when it was added in large quantities and in presence of much acid.

§ In acetanilide mixture containing sodium bicarbonate enough acid must be added so that the liquid is strongly acid toward methyl-orange T. S.

the contents of the flask and slowly heated to boiling. The clear solution is cooled and rotated occasionally until the excess of acetanilide separates out, adding a trace of acetanilid if crystallization does not set in promptly. The liquid is filtered through a small pledget of cotton into an Erlenmeyer flask and the transfer completed with 25 Cc. water. Then 1 Cc. hydrochloric acid, U. S. P., and 25 Cc. approximately fifth-normal iodine solution, 25 Gm. iodine and 36 Gm. potassium iodide in 1000 Cc. are added and the mixture rotated occasionally during one-half hour. The clear supernatant liquid is decanted to a small short-stemmed funnel containing a loosely-packed plug of asbestos; finally the precipitate is transferred and the flask and the precipitate washed with 25 Cc. tenth-normal iodine solution to which has been added .25 Cc., or 5 drops, hydrochloric acid. When the wash fluid has passed, the funnel is placed in the neck of a separator, about 2 Gm. sodium sulphite introduced into the flask in which the precipitation was made, 10 Cc. water added, rotated to dissolve any adhering caffeine periodide, the solution poured into the funnel containing the precipitate and solution facilitated by gently stirring the precipitate with a short glass rod.* When the liquid has passed, the flask and funnel are rinsed with several small portions of water, using about 15 Cc. in all. The liquid is now extracted with five portions, 10 Cc. each, of chloroform, the extractions are filtered through asbestos into a small flask,† the solvent distilled slowly from a water-bath in such a way that active ebullition does not occur and the flask dried at 95–100° during three hours.

The weight of acetanilide was obtained by subtracting the weight of caffeine found from the total weight of the chloroform extraction obtained (at a. or b.).

Caffeine (dry) taken: .0998 Gm., .0998 Gm., .0997 Gm., .0997 Gm., .0998 Gm., .0997 Gm., .0472 Gm., .0505 Gm., .1250 Gm., .1178 Gm.

Acetanilide taken: 1.0297 Gm., 1.0464 Gm., .4719 Gm., .5001 Gm., 1.4005 Gm., 1.4619 Gm., 1.4403 Gm., 1.4547 Gm., .4262 Gm., 1.5811 Gm.

Caffeine found: .0983 Gm., .0983 Gm., .0988 Gm., .0985 Gm., .0977 Gm., .0977 Gm., .0464 Gm., .0495 Gm., .1239 Gm., .1164 Gm.

Acetanilide found: 1.0299 Gm., 1.0491 Gm. (b)‡, .4738 Gm. (b), .5001 Gm., 1.4019 Gm., 1.4669 Gm. (b), 1.4426 Gm., 1.4572 Gm., .4261 Gm., 1.5830 Gm.

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* The amount of sodium sulphite is largely in excess of that required to dissolve the periodide and yield a colorless, alkaline solution. If, because of deterioration of the sodium sulphite, the filtrate is yellow and shows an acid reaction when a drop of litmus, or cochineal, T. S., is added, the more sodium sulphite must be added.

† If close results are desired, a flask of nearly the same size and weight should be used as a counterpoise.

‡ The determinations marked (b) were made by drying the chloroform extract containing the acetanilid plus caffeine at 55°, the remaining by drying at 95° during two hours.

Per cent. caffeine indicated: 98.5 per cent., 98.5 per cent., 99.1 per cent., 98.7 per cent., 97.9 per cent., 98.0 per cent., 98.3 per cent., 98.0 per cent., 99.1 per cent., 98.8 per cent.

Per cent. acetanilide indicated: 100.02 per cent., 100.26 per cent., 100.4 per cent., 100.00 per cent., 100.10 per cent., 100.34 per cent., 100.16 per cent., 100.17 per cent., 99.98 per cent., 100.12 per cent.

The Chair stated that, without objection, the papers just read would be received and referred to the Publication Committee, and it was so ordered.

Mr. C. E. Caspari suggested that the hour was growing late, and there were still a number of papers to be presented, and moved that an adjourned session of the Section be held for the purpose of completing the program on Friday afternoon, at 2 o'clock, in the Council room. The General Secretary moved that the hour be set at 4:30 Friday afternoon, instead of 2 o'clock, as giving more time for the session, in view of the meeting of the Association at 3 o'clock in general session for the installation of officers, and the motion was so put and carried.

Thereupon, on motion, the Section stood adjourned to the time indicated.

THIRD SESSION—FRIDAY AFTERNOON, SEPTEMBER 8, 1905.

The third (adjourned) session of the Scientific Section was not called to order until 5 o'clock p. m., on account of a prolonged session of the Association held for the installation of officers and other business.

The Chairman (Mr. Gane) having called the meeting to order, Mr. Henry Kraemer exhibited and explained the operation of a bottle for keeping sterilized pharmaceutical preparations, the text of his paper on the subject being as follows:

A DISPENSING BOTTLE FOR STERILIZED PHARMACEUTICAL PREPARATIONS.

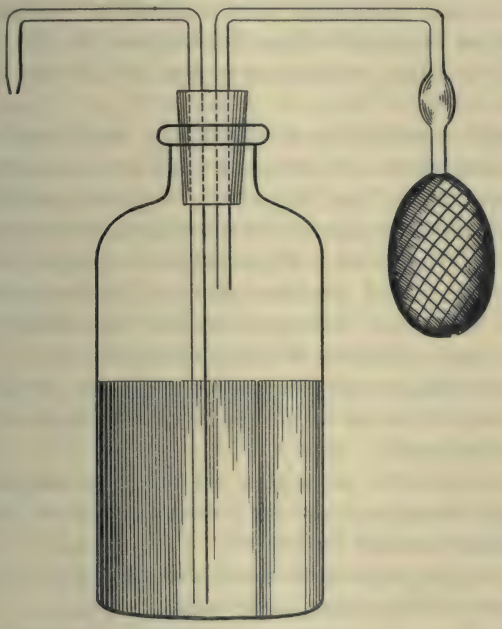
BY HENRY KRAEMER.

That micro-organisms are present in pharmaceutical preparations, as ordinarily prepared, particularly aromatic waters, has been known for a great many years, this knowledge dating back as far as the investigations of Biasoletto, of Trieste, in 1832. During the past twenty-five years quite a number of papers dealing with the changes in pharmaceutical preparations due to micro-organisms have been published. One of the most valuable of these papers was the one by Von der Wielen published in the *Pharmaceutische Zeitung* some years ago, in which the subject of sterilization in pharmaceutical practice is extensively considered.

Under ordinary circumstances many pharmaceutical preparations, as infusions, syrups, solutions, medicated waters, etc., will not keep for any

great length of time unless some preservative be added. It is well known on the other hand that many of these preparations will keep almost indefinitely if prepared and kept under sterile conditions, except in those solutions where chemical changes take place, as with solutions of cocaine and of chloral, or where heat injures the preparation, as syrup of lemon.

Generally speaking it is a mistake to use substances which are considered to be in the nature of preservatives in the keeping of pharmaceutical preparations. Unless these substances are used intelligently they serve to increase the tendency to spoil of the preparations to which they are added rather than to prevent changes due to micro-organisms. Even glycerin, which is considered such an excellent preservative for pharmaceutical preparations, has really but very feeble antiseptic and germicidal proper-



ties. Rosenau has shown (Bulletin No. 16 of the Hygienic Laboratory, of the U. S. Public Health and Marine Hospital Service) that if less than 10 per cent. of glycerin be added to a nutrient medium the growth and multiplication of many forms of bacteria are accelerated, and that not less than 50 per cent. by volume of glycerin is necessary to restrain all bacterial growth in a solution.

While it is comparatively easy to prepare a sterile solution and to keep it in this condition with the apparatus that the bacteriologist uses, this apparatus is not convenient for dispensing purposes. The subject of handling and dispensing sterilized pharmaceutical preparations has occu-

pied my attention for some years past, and in 1903–04, one of my students, Wilbur L. Lafean, made at my suggestion, a dispensing bottle, which I am about to describe, and with which we carried on a number of experiments for testing its efficiency. Some of these preparations have kept for nearly two years now.

In construction the bottle is a modified combination of an atomizer and the ordinary wash-bottle of the laboratory. An ordinary bottle is used. This is fitted with a rubber stopper through which two glass tubes pass. These glass tubes are bent at right angles and the free ends directed downwards as in the illustration, experience showing that micro-organisms in air tend to fall downwards rather than to rise, and thus their entrance into the tubes is obviated. The tube through which the air is forced for expelling the liquid, has inserted in it a small plug of absorbent cotton for filtering the air, and this end is connected with an atomizer bulb. The atomizer bulb can of course be detached and used on other bottles.

The method of making sterile preparations and of using this bottle is as follows:

1. The bottle is washed in the usual way, then rinsed with sterilized water. It is then allowed to drain, and when dry it is heated in a hot-air oven at a temperature of 130° to 150° C. for 30 to 45 minutes.

2. The preparation is placed in the sterilized bottle immediately after being prepared. The bottle is stoppered with a plug of sterilized cotton and a paper cap placed over the mouth. The bottle containing the preparation is then placed in a steam sterilizer and heated at a temperature of 100° C. for 30 minutes on three consecutive days.

3. The rubber stopper and the attached tubes are sterilized in a steam sterilizer at 100° C. for 30 to 45 minutes, or better in an autoclave at 110° C. for 15 minutes.

4. Before sterilizing the preparation the third time the absorbent cotton and paper cap are removed, and the previously sterilized stopper together with the attached tubes are introduced.

5. When cool the preparation can be used as needed by simply attaching the atomizer bulb and using in the ordinary way.

There are other useful containers, as the one described by Mr. Gane a year ago at the meeting of this association, but these have their special merits and are used in a somewhat different manner.

Mr. Scoville suggested that if a bulb were blown in the tube and filled with cotton, loosely, it could not be forced further in, and would act even more effectively as a filter.

The paper was referred for publication.

The Chair called on Mr. Wilbert to present a paper on approximate measures of the Pharmacopœia, which he did, exhibiting some photographs illustrative of his subject. The full text of his paper here follows:

THE APPROXIMATE MEASURES OF THE U. S. P.

BY M. I. WILBERT,

Apothecary at the German Hospital, Philadelphia, Pa.

If any apology were needed for reviving the discussion on popular dose measures, it is to be found in the fact that the members of the Committee on Revision have, unnecessarily perhaps, included a table of approximate measures in the recently issued eighth decennial revision of "The Pharmacopœia of the United States of America."

From the fact that the monographs and other statements that are contained in the Pharmacopœia are generally accepted as being authoritative, at least in so far as they relate to the preparation and the administration of medicinal substances, we would be led to suppose that considerable thought and study had been devoted to a careful consideration of the necessity, or at least the desirability, of including a table of approximate measures, and that if included the equivalents would represent, at least approximately, the actual as well as the relative capacity of the spoons in common use, with a view of correcting any errors in the generally accepted equivalents if they existed. Under the heading "Approximate Measures" the Pharmacopœia asserts that "these are used by physicians and pharmacists to designate doses of liquid medicines," and further directs that the following values for approximate measures should be used:

4 Cc. = 1 fluidrachm = 1 teaspoonful.

8 Cc. = 2 fluidrachms = 1 dessertspoonful.

16 Cc. = 4 fluidrachms = 1 tablespoonful.

It will be noted that the equivalents that are given as metric quantities while nearly 10 per cent. higher than the exact equivalents for apothecaries' fluid measure have the same relative proportions, and that otherwise this table does not differ from similar tables that were published upwards of a century ago.

To the ordinary observer it would appear that the official table is based on the popular assumption that a tablespoon has the equivalent capacity of four teaspoons, and that the metric system of weights and measures is a part of, or is in some way related to or dependent on, the weights and measures now generally used in this country.

That both of these assumptions are fallacious has repeatedly been pointed out, but they nevertheless persist, and are largely responsible for, the slow progress that the metric system of weights and measures has made among English-speaking people.

That these assumptions should be endorsed in such an authoritative work as our own Pharmacopœia is particularly unfortunate, and especially so in view of the admittedly high scientific character of the remaining portions of the work. The inconsistency in this connection is particularly evident when we remember that a large number of drugs and preparations are directed to be standardized, and in some cases are not permitted to

vary more than the fraction of one per cent., while in this table of approximate measures the Pharmacopœia itself directs equivalents that are known to vary from 20 to 60 per cent. from the normal.

That attention has repeatedly been directed to this apparent discrepancy in the size of spoons, is evidenced by a review of recent pharmaceutical or medical literature. Some three years ago (American Journal of Pharmacy, 1902, pages 120, 218 and 495) a series of experiments were carried out at the German Hospital, Philadelphia, that appeared to demonstrate, conclusively, that the various sizes of spoons in general use at that time did not, even approximately, correspond to the usually accepted equivalents of capacity, 1, 2 and 4 fluidrachms, and that the generally accepted ratio of 1, 2 and 4 was not a correct one.

It was further demonstrated that there is less variation in the size and actual capacity of the several kinds of spoons than is usually supposed, and that the ratio of the actual capacity corresponds very closely to the ratio of the equivalents of capacity used in France: where the capacity of the several spoons is considered as being the equivalent of 5, 10 and 15 Cc.

A resumé of the results obtained at that time was reported to the American Pharmaceutical Association at the meeting in Philadelphia in 1902 (Proc. A. Ph. A., vol. 50, p. 408), and that Association endorsed the conclusions arrived at by resolving "that in connection with the use of the metric system the following equivalents be recommended: One teaspoonful equals 5 Cc.; one dessertspoonful equals 2 teaspoonfuls or 10 Cc.; one tablespoonful equals 3 teaspoonfuls or 15 Cc.

At the meeting of the American Medical Association in New Orleans in 1903, the then Section on Pharmacy, Materia Medica and Therapeutics, adopted a set of resolutions to practically the same effect. In addition to this, the French equivalents for spoonful quantities have been accepted by not a few medical practitioners and medical authors as being not alone approximately correct, but particularly convenient in their every-day work.

Despite the reported evidence, despite the endorsement of at least two National Associations, and despite the practices that are known to have been followed in countries where the metric system of weights and measures has been used for upwards of a century, the members of the committee on revision of the U. S. P. have adopted and expect us to follow a series of approximate measures for metric quantities that are neither decimal in character nor approximately correct.

To be positively assured of the correctness of the observations made some years ago, and also to be in a position to demonstrate absolutely the exact capacity of spoons, it was decided to make permanent casts of the capacity of a number of the several kinds and sizes of spoons in common use.

As a preliminary, experiments were made with a variety of materials for making the casts, such as wax, cacao butter, paraffin, modelling clay, plaster of Paris and a number of plastic masses of varying composition. A slow-setting dental plaster was finally decided on as offering the quickest and best method of securing a satisfactory cast of the bowl of a spoon, and this material was subsequently used in all experiments.

The method of procedure is a simple one, the bowl of a spoon carefully washed, and perfectly dry, is coated with a thin film of oil or grease and is then filled with the requisite quantity of dental plaster, that has previously been mixed with sufficient quantity of water to give it the consistency of cream. The spoon must be carefully supported until the plaster has set sufficiently to retain its shape, after which it may be put in any desirable warm, dry, place to further set and to harden. After being thoroughly dried, the cast can be dipped in either melted wax, or in melted paraffin, and may then be immersed in many of the ordinary liquids, being quite impervious to moisture. To facilitate weighing, a piece of silk may be securely fastened in the plaster while the cast is being made. The resulting cast, by the attached thread, may be suspended from the arm of an analytical balance and weighed either in air or immersed in any desired liquid. The difference between its weight in air and its weight in any given liquid indicating the weight of the liquid displaced. With distilled water, at ordinary temperatures, this weight also represents the exact volume of the water displaced and thus indicates absolutely the exact capacity of any given spoon, at any given point.

There are, it is true, several possibilities of error (the attached string and the difference in the density of water at different degrees of temperature), but as these errors would manifest themselves only in the second or third decimal places and as no attempt has been made, at this time, to extend the figures beyond the first decimal point, this possible error may safely be ignored.

In this connection it will not be necessary to give a detailed account of the exact equivalents that were obtained. Suffice it to say that, in a general way at least, they fully corroborate the results previously reported, and that we are now in a position to positively assert that spoons, as sold at the present time, do not correspond, even approximately, in capacity to the quantities indicated in the official table of approximate measures. Teaspoons, evenly full, have a capacity of from 4.6 to 5.5 Cc. Dessertspoons will hold from 8.4 to 10.4 Cc., and tablespoons from 12.8 to 15.6 Cc.

Many of the newer styles of dessert- and tablespoons have a slight curve to the upper edge or rim of the bowl, and all spoons will, when filled as they ordinarily are, hold from 10 to 20 per cent. more than the quantities indicated here.

The important fact, however, and the fact that has been repeatedly dis-

covered by observing medical practitioners, is that the teaspoon has a much greater capacity than is usually accorded it, and that the relation between the tea and the tablespoon is not as 1 is to 4 but is, very much more nearly, as 1 is to 3.

That this particular ratio is not a new one, and that it has been quite fully recognized abroad, is evidenced by the fact that both the French Codex as well as the Belgian Pharmacopœia direct that 5 Cc. be accepted as the equivalent of a teaspoonful, and that 15 Cc. or three times that quantity be considered as the equivalent of a tablespoonful.

In conclusion, it may be permissible to recapitulate, briefly, some of the reasons why 5, 10 and 15 Cc. should be more generally adopted as the equivalents for tea, dessert and tablespoonfuls. Probably the most important reason is, that these figures represent decimal quantities and are readily multiplied to, or divided into, full round numbers.

The same equivalents are used in other countries, where the metric system of weights and measures has been thoroughly well established. The quantities indicated more nearly represent the exact as well as the relative capacity of the several kinds and sizes of spoons that are sold and used at the present time.

Assuming that spoons are, and will continue to be, used as medicine measures, the American Medical Association as well as the American Pharmaceutical Association have endorsed the decimal quantities, and last but not least the general adoption of these figures, as dose-units, would tend to further demonstrate that the metric system of weights and measures is something distinct and apart from the conglomerate of weights and measures that is so persistently adhered to by the proverbially over-conservative English-speaking people.

The Chair stated that, without objection, the paper would take the usual course, and it was so ordered.

Mr. E. G. Eberle presented in abstract the following paper, exhibiting samples of the plants discussed :

NOTES ON SOME MEDICINAL PLANTS OF TEXAS.

BY E. G. EBERLE.

The following plants furnishing official drugs grow in Texas. Most of of them are native or have become naturalized, several are cultivated, and a few have escaped from cultivation : Apocynum cannabinum, Acorus Calamus, Calendula officinalis, Carum carui, Chimaphila umbellata, Coriandrum sativum, Euonymus atropurpureus, Eupatorium perfoliatum, Ficus Carica, Foeniculum vulgare, Gelsemium sempervirens, Gossypium herbaceum, Punica Granatum, Grindelia squarrosa, Hamamelis virginiana, Humulus Lupulus, Arctium Lappa, Marrubium vulgare, Matricaria Chamomilla, Mentha viridis, Mentha piperita, Chenopodium anthelminticum,

Erigeron canadensis, Ricinus communis, Cucurbita Pepo, Phytolacca decandra, Prunus domestica, Prunus serotina, Quercus alba, Rhamnus Purshiana, Rhus glabra, Rubus villosus, Seronoa serrulata, Saccharum officinarum, Salvia officinalis, Sassafras sassafras, Scutellaria lateriflora, Aristolochia reticulata, Sinapis alba, Brassica nigra, Spigelia marilandica, Stillingia sylvatica, Datura Stramonium, Taraxacum officinalis, Pinus palustris, Ulmus fulva, Viburnum prunifolium, Agropyron repens, Zea Mays, Fagara Clava Herculis.

Among the Texas plants the following may be mentioned as of interest either on account of the properties they possess or because closely related to official species:

Acacia farnesiana is known in Texas as huisache, chiefly found in the arid region along the lower Rio Grande. It sometimes attains the height of thirty feet, usually less; the branches form a spreading, round head. The leaves are sensitive to weather, the opposite leaflets closing together at night or when cloudy, and open after sunrise or as the sky brightens. The bark is reddish-brown, thin, irregularly broken, exfoliating in large, thin scales. The trunk is seldom over a foot in diameter; the wood is hard, compact and durable. It is of a rose-red color, used to some extent for cabinet work, but serves principally for fuel. The wood and pods contain considerable tannin, a decoction of the latter with an iron salt being used by the Mexicans to make ink. The seeds, when chewed, smell and taste like garlic. The flowers, which appear in February and March, are yellow, and very fragrant, reminding one of the odor of a violet, only more intense; the perfume is carried by a breeze for quite a distance. Several years ago Messrs. Schimmel & Co. subjected the oil obtained from the flowers to thorough investigation, and published their results in their semi-annual reports (1899–1904). The tree yields a gum resembling in appearance and qualities acacia, more so than the mesquite gum. Very little use is made of the flowers in Texas, although there has been some inquiry relative to them by perfumers. The yield of a tree would be little, if any, in excess of two pounds of dried flowers. Locally they are sometimes used medicinally in the form of an infusion for a sedative; aphrodisiac properties are also ascribed to them.

Sophora secundiflora, or coral bean, contains sophorine; by Mexicans the bean is sometimes used as an intoxicant. The resulting exhilaration is followed by a long, deep sleep. An overdose produces convulsions and death.

Glycyrrhiza lepidota resembles liquorice root in taste, and contains about five per cent. glycyrrhizin.

The cassias are well represented, but none of them seem to possess the active properties of the official varieties.

Aside from the official species of coniferæ we have Juniperus occidentalis, monosperma, pachyphloea, flaccida, oxycedrus and virginiana. Pinus

edulis furnishes an edible nut, and yields an oil having a lemon-like odor, and otherwise also seems to differ from the turpentine oils.

Juniperus pachyphloea yields, by tapping the trunk, a light-colored, thick oleoresin, which is used to some extent in urinary disorders. Ephedra antisyphilitica is known on the plains of Texas as canatilla. It is a shrub with numerous equisetum-like branches, two to four feet high, the leaves being merely bracts. The plant contains considerable tannin. It is used in the form of an infusion or decoction in the treatment of gonorrhœa and syphilis. In the former ailment it is used both as an injection and internally. In excessive doses it has been known to cause strangury.

Of the Chenopodiaceæ there are Chenopodium ambrosioides, capitatum, album, botrys and others; the latter is known as Mexican tea, and used as a tonic and anthelmintic.

Twenty or more species and varieties of Croton are found, many of which are used in the place of tea or coffee as stimulants. No unfavorable results have been noticed from drinking the infusion and the effect is said to be pleasant.

Aside from the official Stillingia, linerifolia, augustifolia, spinulosa and dentata are prevalent. Jatropha macrorhiza has a large globular rhizome with emetic and purgative properties. It is kept in drug-stores along the Mexican border and is known as Jalapa.

Krameria parvifolia, ramosissima, canescens and secundiflora grow here. The latter in medicinal properties seems the equal of the official and also in tannin content. Several of the Polygalas of Texas have the properties of the official. The Polygonaceæ are well represented by plants containing tannin. A few years ago the Canagre plant came into considerable prominence and to some extent the plant is still cultivated. Eriogonum longifolium is considered by old settlers a specific for flux and is still used quite extensively by the laity. In the early days a settlement near Dallas became afflicted, and the death-rate from it reached nearly the limit until use was made of an infusion of the root of this drug which locally is known as red root. The cures were rapid, and it is said there were no further fatal cases, when used in time. It contains about fifteen per cent. of tannic acid, some resin, emodin, a wax and a red coloring matter.

The berries of Karwinskia Humboldtiana are poisonous, producing paralysis of the spinal chord. The poison seems to reside in the seeds, as the pulp can be eaten without ill effect. Other Rhamnae are R. lanceolata, Caroliniana, Californica, the latter is used to some extent for rheumatism. We have upwards of twenty species and varieties of Eupatorium, some of them being used as diaphoretics, in fevers; others, notably purpureum, are used in kidney troubles, some considering the latter a specific for gravel. Some of them have an agreeable odor, which would indicate the presence of coumarin. E. hyssopifolium has a reputation as a snake-bite remedy. In this connection it might be stated that the number of venomous bite

remedies are quite numerous and known by Mexicans as the Yerbas de la vibora. Of the more prominent is Calophanes linearis (Acanthaceæ). This is used by them externally as a poultice and internally by chewing. The plant is practically tasteless and seemingly devoid of active properties. There are those who will on payment of a small fee allow themselves to be bitten by a rattler, if permitted to make use of this antidote.

The most common of the Berberideæ are B. trifoliata, Fremonti, Swaseyi and repens, the latter containing a large amount of berberine. The fruit is an acid berry of an agreeable flavor.

The last plant I wish to note is the Larrea Mexicana or creosote-bush which covers the prairies west of the Pecos. It contains an acid resin, a wax and a red coloring matter. The resin is said to be identical with shellac, and has been used to some extent for like purposes. The infusion is quite acrid and is used externally as an application for rheumatism and neuralgia. It is also used for dyeing leather red, and on account of its abundance and the intense heat it gives off, for fuel in lime-kilns.

The paper was ordered received and referred for publication.

The Chair stated that the next paper was one on hydrastis culture, by Mr. Lloyd, but as the author was not present, it would be read by title and referred, without objection, and the members could read it at their leisure. It was so ordered. The following is the text of the paper:

AN EXPERIMENT IN HYDRASTIS CULTURE.

JOHN URI LLOYD.

Whoever has kept track of the phases and conditions of the hydrastis subject during the past thirty years is aware that it has required no spirit of prophecy to foresee the early necessity of hydrastis culture. In the publication "Drugs and Medicines of North America," 1885, the writer went into some detail over both the confronting condition, and the approaching problem to which reference has just been made.

With this brief introduction the following note on an experiment in hydrastis culture is offered, in hopes that it may be of use to interested parties just beginning to appreciate present conditions.

Experiment 1. In the hydrastis section of Kentucky, where, in a natural beech woodland undisturbed by the axe, hydrastis grew naturally in beds and had never been collected for the market, these experiments were instituted. The following report may therefore be taken as a statement of fact concerning the result of transplanting the drug, under the conditions given.

Beginning the first of May, and ending with the drying of the plant in the fall, lots of from ten to fifty pounds of green hydrastis obtained from different collectors were planted in rows, about two feet apart, the plants being separated from each other about six inches in the row. From ten

to one hundred pounds a day were sometimes planted, and again, only fifty or one hundred pounds in a week.

Result. All of this hydrastis grew that season. Where the tops had died during shipment of the drug, the root immediately threw up new plants from the reserve buds. Without any loss whatever, the transplanting succeeded. The following season, that which had been first planted came up first. The stalks also grew more thriftily than did those planted later, and it was observed that the stalks from the roots set out at the end of the season were very feeble, as compared with the roots transplanted the last of April and the first part of May. Indeed, a person looking over the woodland bed would observe that the plants earliest set out, stood from one to even two feet in height, and from thence the crop successively decreased in height, until at the extreme side of the patch, the

No. 1. (*Photographed by Mr. Edward Hoffman.*)

Showing full-sized Hydrastis in the background, and cutting sprouts in the foreground.—June.

stalks from the drug set out late in the season were very feeble, and scarcely six inches high.

The result of this experiment indicates that the earlier the drug is transplanted in the springtime, the better is the chance for its succeeding year's robustness, although scarcely any difference in vigor was observed the season of transplanting. This, however, does not apply to roots transplanted *after* the top has dried in the fall, no record of which is named herein.

Experiment 2. Five different lots, ten pounds each, of fresh green

hydrastis from different points in Kentucky, were planted in a woodland thicket with a southeast exposure, said thicket being so dense as to prevent the hot sun beating into it during the summer. In all cases, the plants remained green, thriving during the whole summer. They are shown in the background of Figure No. 1, which was taken one month after transplanting.

At the same time, a lot of fresh goldenseal root was cut into pieces, each piece bearing one or more reserve buds. These were set in a bed in the foreground (see illustration) of the afore-described garden, so as to be under identical conditions. Nearly all of them promptly sprouted, and within two or three weeks produced thrifty-looking small plants, one thousand in number, as shown in the bed in the foreground of Figure No. 1. Figure No. 2 shows such root-cuttings (natural size), with their delicate sprouts.

No. 2. (*Photographed by Mr. J. T. Lloyd.*)

Showing Hydrastis root-cuttings sprouted from the reserve bud.

The next spring, all the old plants showed their heads promptly the latter part of April, and by the first of May were of the size shown in the background of Figure No. 3. Seemingly the entire crop of the full size roots uprose, none being lost. The cuttings, however, shown in the foreground of Figure No. 1, failed to sprout; with the exception of sixteen very feeble plants, as shown in the barren foreground of Figure No. 3, the cross indicating where stood the thousand plants that sprouted so en-

couragingly the preceding year. On examining the roots of the cuttings that lived to sprout, it was found that much of the cut root attached to the bud had rotted. This cutting experiment was therefore a final failure, notwithstanding the promising features of the bed of cuttings the summer of their first growth, from and to the period of their fall slumber.

Résumé. Hydrastis canadensis is a very easy crop to raise by transplanting the entire root. Since the root bears prolific lines of reserve buds from end to end, any of which will sprout the year the cutting is made, it is easy, also, to multiply the plants the season the cuttings are made. But under the conditions cited in the experiment, the cuttings

No. 3. (*Photographed by Mr. J. T. Lloyd.*)

Showing No. 1, the succeeding June. The full-sized root plants are in the background, the cross mark in foreground indicating where the cuttings perished.

exhausted themselves by their growth that same year, as indicated in the experiment offered, which shows the great loss in number through winter killing of the feeble plants. In this connection it should be said that the experiment described was made during a year when a severe drought between the first of August and through the fall, followed the transplanting. Dry weather, as much as winter conditions, tends to the destruction of the feeble young hydrastis, a feature that I shall reserve for another paper on the subject.

Mr. A. B. Stevens, of Ann Arbor, presented in abstract the following paper on Japanese lac, exhibiting two specimens of lac in small tubes, one showing the action when the enzyme is destroyed and the other when active ; also some of the gum with the enzyme active and some treated with acids.

JAPANESE LAC.

BY A. B. STEVENS.

The pure lac is a natural product of Rhus vernicifera, a small tree about fifteen feet high, indigenous to Japan where it is also cultivated in many parts of the country. The largest yield is from trees about fifteen years old, but the age of the tree when the lac is collected varies in different localities, in some places at from five to six years when the stem is the size of a man's arm and in other localities at from nine to ten years old. The time of collecting is from April to the first of November.*

The lac is obtained by making horizontal incisions in the bark with a hook-shaped instrument and alternating from side to side of the tree. The sap is removed from the incisions with a pointed spatula; these operations are repeated at intervals of about four days until the tree is literally covered with grooves. The lac is in the form of a grayish-white emulsion, which on exposure to air changes to brown and finally to black. The raw lac is strained to remove pieces of bark, and then mixed until uniform, when it is ready for use, and is known as "Ki-Urushi." A second grade known as "Seshime-Urushi" is obtained at the close of the season by cutting and binding the branches into bundles, and macerating these with the trunk, in warm water, when more of the sap exudes and is removed from the surface of the water.

The beautiful black color is produced by "Laccasse," a soluble oxidizing enzyme, acting on the resins in the presence of moisture. The best results are obtained by allowing the lac to harden in a moist atmosphere. Therefore the articles coated with the lac are placed in a room and wet clothes hung on the walls or about the lacquered articles. A temperature of from 20 to 30° is best for the action of the enzyme. If the lac is allowed to harden in a dry atmosphere it has a dull appearance, varying in shade from brown to black.

The most important chemical investigations of this lac were made by two Japanese chemists.† Yoshida reports that the lac consisted of a non-volatile resinous acid, which he calls "urushic acid," a volatile poison, gum, identical with gum arabic, diastatic matter and water. I have found that his urushic acid consisted of at least four substances, one of which is the poisonous principle and is non-volatile. Also that the gum and diastatic matter are inseparable. The volatile portion consisted of acetic acid and a small quantity of the resinous acid which was evidently carried over with the steam, but on removal from the distillate by shaking with ether and then evaporating was not volatile or poisonous.

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* For a more detailed account of the methods of collecting, etc., see "The Industries of Japan," by J. J. Rein, p. 342.

† H. Yoshida, Journal Chem. Soc., 1883, p. 472. O. Korschelt and H. Yoshida, Transact. As. Soc. Japan, XII, p. 182.

The resinous substances were removed from the other constituents by dissolving in alcohol and recovering the alcohol by distillation.

SEPARATION BY LEAD ACETATE.

Lead acetate was added to a portion of the alcoholic residue as long as a precipitate was formed. The precipitate which was of a light gray color was washed with alcohol, mixed with fresh alcohol, decomposed with sulphuric acid, and the excess of acid removed with lead carbonate. On evaporating the alcohol a brown oily residue was obtained, which was somewhat darker than the original alcoholic residue, but otherwise similar.

To the filtrate from the lead acetate precipitate, solution of lead subacetate was added as long as a precipitate was formed. The precipitate was of a gray color, but lighter than that obtained by lead acetate. On decomposing the precipitate as above, an oily residue was obtained, which was also lighter than that obtained from lead acetate.

The filtrate from the subacetate precipitate was still of a brownish color. The excess of lead was removed by sulphuric acid, and the excess of acid removed by lead carbonate and filtering. The filtrate was readily precipitated by lead acetate or subacetate. By repeated experiments with the original alcoholic solution, it was found that by precipitation with lead acetate and removing the lead and acid from the filtrate, adding more lead acetate, and repeating this operation until all the resinous substance was precipitated, and finally decomposing the separate precipitates, that a series of oily residues could be obtained, gradually diminishing in quantity and increasing in fluidity, and becoming a shade lighter in color than the preceding. Lead subacetate is a better precipitant than lead acetate. The acetic acid liberated evidently aids in preventing complete precipitation. The fact that the fractions decrease in color and viscosity and that only the last fractions were poisonous indicate that the alcoholic extract consisted of a mixture of two or more substances. But in no case can the above method be considered as a complete separation. Alcoholic solutions of each of the fractions assumed a green or greenish-black color with alkalies, the color varying with the concentration of the solution and the strength of the alkali.

By shaking an ether solution of resinous substances with a one per cent. solution of sodium carbonate a solution was obtained which deposited a reddish-brown precipitate on the addition of an acid. This precipitate was insoluble in all ordinary solvents including acids and alkalies, except fuming nitric acid. This is doubtless the same substance which Yoshida obtained and named "oxyurushic acid," but as it does not possess any of the properties of an acid, Prof. Tschirch suggested the name "oxyurushin," which I have adopted. All of the resinous substances may be converted into oxyurushin by heating with a sufficient quantity of fixed alkali, when it will be precipitated as a black insoluble compound, changing to reddish-brown on the addition of acids.

SEPARATION INTO BENZIN-SOLUBLE AND BENZIN-INSOLUBLE.

At first it appeared as though the alcoholic residue was soluble in all of the ordinary solvents for oils and resins, but investigation proved that it was not completely soluble in all proportions of carbon disulphide, methyl alcohol, amyl alcohol or petroleum benzin. After numerous experiments the following method was adopted: One part of the resinous substance was dissolved in 7 parts of benzin forming a clear solution, but further addition of benzin caused a precipitate. This was then poured into 55 parts of benzin which caused an immediate separation of a thick brown mass, leaving a cloudy liquid. After twelve hours the benzin became clear and was not affected by the further addition of benzin. The benzin was decanted and the precipitate dissolved in a small quantity of benzin and again precipitated by pouring into a larger amount. This operation was repeated several times until the precipitate became entirely insoluble in benzin. By this method the resinous substances were separated into a benzin-soluble and a benzin-insoluble.

SEPARATION OF THE BENZIN-INSOLUBLE INTO METHYL ALCOHOL-SOLUBLE AND METHYL ALCOHOL-INSOLUBLE.

By treating the benzin-insoluble portion with methyl alcohol it could be separated into two substances, one soluble and the other insoluble in methyl alcohol. Only about half of the insoluble portion was soluble in ether, the remainder apparently having undergone oxidation into oxyurushin during manipulation with methyl alcohol and evaporation. This theory is supported by the fact that the methyl alcohol solution becomes cloudy on standing. A similar change doubtless takes place in ethyl alcoholic solutions, though much more slowly, as a slight deposit was noticed when an alcoholic solution was allowed to stand for some time.

SEPARATION OF THE BENZIN-SOLUBLE INTO TWO OR MORE SUBSTANCES.

The benzin solution was evaporated, and one volume of the oily residue dissolved in eight volumes of benzin and four volumes of alcohol added, and the whole thoroughly agitated. Upon standing it separated into two layers. The upper benzin layer was of a yellowish-brown color, the lower alcohol layer reddish-brown. These were separated and the benzin solution washed with alcohol as long as the washings were colored. The benzin was evaporated, leaving an oily, non-poisonous, brown residue. The alcoholic solution was evaporated, leaving a slightly gelatinous residue, and by rapidly washing this with benzin a small quantity of oily residue was separated from the gelatinous mass. Both were poisonous. Further washing with benzin dissolved the gelatinous portion. I believe that the alcoholic portion consists of a poisonous and a non-poisonous substance, but thus far have not been able to make a complete separation. I hope to do this later.

All of the above substances in alcoholic solutions were precipitated by lead acetate, subacetate, silver nitrate, mercurous nitrate, cupric acetate and ferric chloride. The lead precipitates were of a light gray color, gradually becoming darker on standing. All the other precipitates were black.

The resins insoluble in benzin, on exposure to the air in thin layers, slowly changed to oxyurushin. Numerous combustions were made of these, and also of the oxyurushin formed by the action of the alkalies. The oxidation products seem to be the same in all cases. The mean of the results of combustion is as follows:

Found:	*Calculated for* $C_{102}H_{138}N_2O_{19}$:
C 72.137	72.206
H 8.158	8.202
N 1.652	1.656
O 18.053	17.936

THE GUM-ENZYME.

After extracting the lac with alcohol the residue was extracted with cold water and the gum-enzyme precipitated by pouring into strong alcohol. The precipitate was dissolved in a small quantity of water and reprecipitated with alcohol. By repeating the operation several times and finally washing with ether and drying in an exsiccator, it was obtained perfectly white and easily reduced to powder. In physical appearance it is similar to powdered acacia. When so prepared the gum-enzyme is very active, rapidly changing a fresh tincture of guaiac to a deep blue. If an emulsion is made of the gum-enzyme and the separated resins, it soon changes to black, but if a solution of the gum-enzyme is heated before mixing with the resins no change takes place.

TESTS FOR NITROGEN.*

The gum-enzyme was tested for nitrogen by the Lassaigne test which consists in heating the substance with metallic potassium and converting the cyanide so formed into Prussian blue. This test and various modifications of it failed to detect the presence of nitrogen.

When the gum-enzyme is heated in a tube with soda-lime or potassium hydroxide the vapors rapidly change red litmus to blue, but no odor of ammonia could be detected. Prof. Tschirch thought the odor similar to pyrrol. By using larger quantities and condensing the vapors, the distillate gave all of the reactions for pyrrol.

Another evidence of the presence of nitrogen was obtained as follows: An ordinary open combustion tube was filled with copper oxide and ignited in a current of oxygen. After partially cooling, a platinum boat containing the gum-enzyme was introduced, and burned in a current of oxygen.

* For a detailed report of nitrogen in gums see Am. Jour. Pharm., 77, p. 255, 1905.

The products of combustion were conducted into a potash bulb containing a solution of potassium hydroxide, prepared from metallic potassium, and water distilled with potassium permanganate. Just before the combustion the solution was tested and found to be free from nitrogen compounds. After the combustion the solution gave with diphenylamine the blue color characteristic of nitrates. With brucine and sulphuric acid a red color, and with sulphuric acid and sulphate of iron the brown ring test.

SEPARATION OF GUM FROM THE ENZYME.

H. Yoshida states that after removal of the resins by alcohol and extracting the residue with cold water, and then boiling the solution, that he obtained a white precipitate, and assumes that it is the enzyme that has been removed, but such cannot be the case as a solution of the pure gum which is very active does not give any precipitate on boiling. The precipitate may have been some vegetable albumen which was present in the lac, but I have been unable to find it after repeated trials. All attempts to free the gum from nitrogen have been without success.

OXIDATION PRODUCTS GUM-ENZYME.

Mucic acid is the principal product obtained by oxidizing the gum-enzyme with nitric acid of 1.150 sp. gr. Oxalic and tartaric acids were also formed.

HYDROLYSIS OF GUM-ENZYME.

The gum-enzyme was heated for eight hours with two per cent. sulphuric acid, and the acid removed with barium hydroxide and carbonate. The solution was evaporated under diminished pressure, when it formed a light yellow syrup, noncrystallizable, nonfermentable, which reduced Fehling's solution and was dextrorotary.

One part of the syrup was heated one hour with two parts of phenylhydrazine, three parts of sodium acetate, and twenty parts of water. On cooling, an abundant yellow crystalline deposit formed. This was several times recrystallized from hot alcohol when the melting-point remained constant beginning at 162° C. and was complete at 164° C. without the liberation of gas. The crystals were in small, spheroidal clusters, which under the microscope appeared to consist of aggregations of needles. This corresponds exactly with the description and melting-point given for phenylsorbinosazone.* A second crop of crystals were obtained by concentrating the mother liquor. These were somewhat darker than the first and had a melting-point of 157° C., but with the production of gas. This corresponds with the description given for inactive sorbinazone.

Bertrand † when working with soluble oxidizing ferments used the gum-

* Vaubel Quantitative Bestimmung. Organ. Verbindungen, II Band 3, 304.

† Bull. Soc. Chem. 3 series 51, p. 259, 1891.

enzyme from Japanese lac under the name "Laccasse." He reports that it contained 0.44 per cent. of nitrogen which he determined by heating with soda lime and estimating the ammonia formed by titrating with decinormal sulphuric acid. From this he calculated the amount of enzyme present by assuming that it has the elementary composition of albuminous substances. He then gives the composition of the gum-enzyme as:

Water	74	per cent.
Gum	84.95	"
Laccasse	2.50	"
Ash	5.17	"

From the preceding work it seems to me that I am justified in saying that what he estimated as ammonia was not ammonia but pyrrol.

POISONOUS PRINCIPLE AND ITS ACTION.

Prof. J. J. Rein describes the lac poisoning as follows:*

"It is a peculiar, not very painful, and not at all fatal, but always disagreeable disease, always attacking any one new to the work. It appears in a mild reddening and swelling of the back of the hands, the eyelids, ears, the navel and lower part of the body, especially the scrotum. In all these parts great heat is felt and violent itching and burning, causing many sleepless nights. In two or three days the crisis is reached, and the swelling immediately subsides. In severe cases small festering boils form also. This lacquer disease is not only caused by handling of the lac, but by its evaporation chiefly, especially that of the sharp Se-shime, to which I owe my own illness." . . . "The poison, however, is a volatile substance, and has nothing to do with the lac acid and its higher oxidation as Korschelt believed. If the poisonous property disappears in the drying of the plant, this amounts to nothing save that the volatile poison fully escapes in this manner. A considerable part of it is driven off in the preparation of the several kinds of lacquer, and by stirring in open vessels. For this reason the lacquers mixed with colors are regarded far less dangerous than the raw lac and its direct derivatives. When such lac has been for a long time shut up in a closed box or tub, the experienced workman turns away his face when the vessel is opened that he may not inhale the accumulated vapors."

Yoshida also states that the lac contains a volatile poison, which is dissolved with the urushic acid by alcohol, but is almost completely driven off by drying the acid at 105° to 110° C. Bertrand † says that the lac must be handled with the greatest precaution, because the least traces in the state of vapor produce on the face, hands and arms an intense rubrefaction, accompanied by intense itching, and adds that these malicious

* The Industries of Japan, p. 349.

†Annal. de Chem. et de Phys., Series XII, 1897.

properties make the study of the lac very tedious, and he was obliged to interrupt the studies on account of individual sensitiveness.

With these statements before me it was not without misgivings that I undertook the study of the lac, and these were not allayed by my first experience. The first sample received was in a glass can with metal top, which had become sealed by the lac and was difficult to remove, but when finally started was accompanied by a slight sound of escaping gas. In about 36 hours an inflamed spot about 2 Cm. by 5 Cm. appeared on my wrist; it itched intensely for about a week and then disappeared. Laboring under the supposition that I was dealing with a volatile poison, I was extremely cautious not to come in contact with the vapors in any form, but supposed that I was practically safe after the alcohol had been distilled and the residue had been heated for some time. While shaking out an ether solution of the alcoholic residue with sodium carbonate solution it was difficult to keep the hands entirely free from the solution, and no especial pains were taken to remove it except to carefully wash with soap and water. However, after working some time with it my face began to swell, and continued until my eyes were nearly closed. It extended over hands, arms and lower limbs to the knees; the desire to scratch was very great, so that it was almost impossible to stop. This was also true of the face and ears to some extent, but here the sensation was more that of burning. After about a week the face became normal and I was able to resume my work, but the limbs continued to itch and remained covered with a fine rash. After several weeks I became convinced that the underwear had absorbed some of the poison, and though frequently washed still retained it, or that they acted as an irritant to the inflamed surfaces. Soft gauze underwear was then worn next the skin, when the flesh soon became normal.

Dr. Jadassohn, Professor of Skin Diseases in the University of Berne, stated that the above symptoms did not prove that the poisonous principle was volatile, and kindly volunteered to make the physiological tests for me in order to determine whether the poisonous principle is volatile or not. He found that the rabbit was very sensitive to the poison. The method of testing was to rub a small quantity of the substance on the inside of the ear for two or three minutes. If poisonous, inflammation appeared in from two to five days, and the surface soon became covered with watery blisters. This condition lasted about fourteen days when it gradually disappeared.

The sterilized lac prepared by suspending a tube of the lac in boiling water for half an hour was poisonous. An alcoholic solution of the lac was distilled, and the distillate tested but was not poisonous. After the alcohol was removed the distillation continued, when a small quantity of aqueous distillate was obtained, but this was also inactive. The residue in the retort was extremely poisonous. A fresh can of lac was thoroughly

cooled to prevent the escape of gas while opening, too small openings made, and tubes introduced. A small quantity of absorbent cotton was placed in the tube used for the exit of vapor to prevent particles of the fluid from being forced through. The vapor was then slowly forced out of the can upon the ear of the rabbit. Part of the ear was previously moistened. The vapor was entirely without action. Since then I have worked over the lac, while evaporating it under all conditions without the slightest inconvenience. The alcoholic residue was later separated into two parts, one soluble and the other insoluble in benzin. The first was poisonous and the second non-poisonous. A thin layer of the first was left in an open crystallizing jar for four months, when it was found to be still poisonous. Another sample of five Gm. was left in an open vial on a laboratory shelf for ten months including the hot summer months. This was then tested on my arm and was found to be still active. These facts are sufficient to prove that the poisonous principle is non-volatile. Doubtless the cases of poisoning that have occurred from opening retainers have been due to minute particles of the lac being forced out with the vapor which probably consisted principally of acetic acid.

The poison is extremely active even in minute quantities, and as it forms a part of the resinous body it is very difficult to remove from the skin or clothing. Washing with soap and water is not sufficient to insure its removal. If the hands after contact with the lac are thoroughly washed with soap and water until they are to all appearances clean, and then wet with a solution of caustic alkali, black spots will appear wherever the lac has been in contact. A mixture of powdered soap, pumice-stone and carbonate of soda gives the best result. However, to insure safety, I have usually followed this with soap and sand. The poison seems to have little or no effect upon the thick skin on the inside of the hand, but to prevent its transmission to other parts it should be removed as soon as possible. For example, by accident some of the benzin solution was thrown into one eye and over one hand. The eye was thoroughly washed with benzin and alcohol, but in my anxiety for the eye, the hand was forgotten for twenty or thirty minutes, when it was thoroughly washed with benzin and alcohol followed by soap and sand. The eye escaped without further inconvenience than that caused by the benzin, but in thirty-six hours the surface of the hand became slightly swollen, itched considerably for a week, and then appeared to be covered with a thin, dry scale, which finally disappeared. Since then I have tested different parts of the substances to determine whether or not they were poisonous, by cutting a hole 6 Mm. in diameter in a piece of gum paper, pasting this on the arm, and applying the substance to the opening. In from thirty minutes to one hour the paper was removed, and the spot washed with ether or benzin. When the substance was poisonous the spot became red and began to itch within thirty hours. From three to five vesicles usually appeared. The itching

was not intense, usually lasting only a few minutes at a time. A dry scale formed over the surface and remained for several weeks after all irritation ceased.

The poison has not at the present time been isolated in a pure condition.

Dr. Jadassohn and his assistants, Drs. Winkler and Schulz, made twenty-six tests with parts of the lac obtained under different conditions.

Only that portion which is completely soluble in benzin is poisonous, and this, we have previously seen, has been separated by shaking out the benzin solution with alcohol into two parts, one soluble in alcohol and poisonous, the other insoluble in alcohol, but soluble in benzin, and non-poisonous. I have elsewere stated that by fractional precipitation with lead acetate a partial separation of the poison was obtained, but that I did not consider it a practical method.

After the above experiments with the poison were made, I received from Dr. F. Pfaff a reprint of his article "On the Active Principle of Rhus Toxicodendron and Rhus Venenata."* As the poisonous action of these plants is practically identical with that of Rhus Vernicifera, his work is of special interest in this connection. He has conclusively proven that the poisonous principle of poison-ivy is non-volatile, thus shattering the false idea that has existed for so many years. He claims to have separated the poisonous principle in a pure form by fractional precipitation with lead acetate as an oil. Dr. Pfaff gives the composition of his lead compound as $C_{21}H_{30}O_4Pb_6$, and proposes the name "Toxicodendrol" as the name of the poisonous principle. The poisonous principle of Japanese lac is so intimately associated with the resin of the lac that I have not considered the method of fractional precipitation to be a complete separation. Preceding investigation indicates that the poisonous principles of these plants are identical, but further investigation is necessary before this can be accepted as conclusive. I hope during the coming year to separate the poison from both these plants, and determine their relation; also to separate the poison from Japanese lac in a pure condition.

The present researches in Japanese lac were undertaken in the laboratory of the Pharmaceutical Institute of Berne under the guidance of my most highly esteemed instructor, Prof. Dr. A. Tschirch. To him and also to Prof. Dr. Oesterle I desire to express my warmest and sincerest thanks for the inspiration and friendly interest and advice which has ever been so freely and so kindly given.

The lac for this investigation was kindly presented by Forester Shirasawa, of Tokio, Japan, and the Rhus Company, Frankfort, Germany. To these I extend sincere thanks.

After a few brief remarks upon the paper by Mr. Kremers and the General Secretary, it was ordered received and referred for publication.

* The Journal of Experimental Medicine, vol. ii, no. 2, p. 181, 1897.

At the request of the chair Mr. Charles E. Caspari then presented in brief abstract, with some blackboard illustrations, the following paper on arsenic trioxide :

AN EXPEDITIOUS METHOD FOR THE DETERMINATION OF ARSENIC TRIOXIDE.

BY CHARLES E. CASPARI AND LEO R. A. SUPPAN.

The usual method recommended for the determination of arsenic trioxide consists in dissolving the material under examination in water with the aid of sodium bicarbonate and from the amount of iodine required to oxidize the sodium arsenite to arsenate, calculating how much arsenic trioxide was present. This method is recommended by the United States Pharmacopœia of 1890, and also by the 8th Revision, and as it stands in these two books it is open to two objections. In the first place it requires a very long time to dissolve 0.1 Gm. of arsenic trioxide in water with the help of 1 Gm. of sodium bicarbonate, ten hours being frequently required even with the aid of gentle heat, and then some of the bicarbonate is converted into carbonate which reacts with iodine, producing high results for the amount of arsenic trioxide present. In the second place, if solution be accelerated by using a higher temperature, more carbonate is formed and the same difficulties are encountered.

We have had frequent occasion to determine arsenic trioxide and it seemed to us desirable to have a rapid method which was at the same time accurate. The results in this paper will show whether we have succeeded. It has been suggested that the arsenic trioxide be dissolved in sodium hydroxide, in which solution takes place very readily; that then carbon dioxide be passed into the solution until all the sodium hydroxide has been converted into sodium bicarbonate. Theoretically this is a good solution of the problem, but practically it is tedious because it requires much time to convert the last trace of hydroxide into bicarbonate. For this reason, then, this method is rejected.

Three different methods suggested themselves to us. All of these were tried and all gave the same results. First, the arsenic trioxide is dissolved with the aid of heat in dilute hydrochloric acid. To the solution a slight excess of sodium hydroxide is added, the excess of sodium hydroxide neutralized with $\frac{N}{1}$ sulphuric acid and an excess of a saturated solution of sodium bicarbonate added. The solution is then titrated with a standardized solution of iodine. Second, the arsenic trioxide is dissolved in a dilute solution of sodium hydroxide with the aid of heat, the solution is cooled and neutralized with $\frac{N}{1}$ sulphuric acid, an excess of a saturated solution of sodium bicarbonate is added and then the solution is titrated as usual. Third, the arsenic trioxide is dissolved in a saturated solution of sodium bicarbonate at the boiling temperature, the solution is cooled and any carbonate which may have been formed is converted into bicarbonate by $\frac{N}{1}$ sulphuric acid, an excess of the saturated solution of sodium bicarbon-

ate is added and the titration with the solution of iodine effected as usual. The determinations according to each of these methods were made on the same sample of arsenic trioxide with practically identical results. These results, with more details concerning the methods, follow.

It was our desire to experiment on a sample of arsenic trioxide of high purity, and this was kindly given us by the J. T. Baker Chemical Co. of Easton, Pa., whom we take this opportunity of thanking for their kindness and courtesy.

Two gravimetric determinations were made of the purity of this sample in order that we might have a standard by which to judge the results of our methods. The gravimetric method was the usual one, that is, the arsenic was precipitated as sulphide, washed with pure carbon disulphide, dried and weighed. 0.5002 Gm. of the sample yielded 0.6188 Gm. of arsenic trisulphide, corresponding to 99.49 per cent. of arsenic trioxide.

0.5100 Gm. of the sample yielded 0.6313 Gm. of arsenic trisulphide, corresponding to 99.55 per cent. of arsenic trioxide.

The mean of these two results showed that the sample on which we were working contained 99.52 per cent arsenic trioxide.

By our first method a weighed quantity of the sample is dissolved in 20 Cc. of a 10 per cent. solution of hydrochloric acid and 20 Cc. of distilled water by heating on a hot plate, care being taken to avoid boiling, which would entail a loss, as at that temperature arsenous chloride, which is present in the solution, is volatile. As soon as solution has been effected and the solution has cooled, a few drops of phenolphthalein are added, and enough of a 10 per cent. solution of sodium hydroxide is added to produce a distinct alkaline reaction. The color of the solution is just discharged with $\frac{N}{1}$ sulphuric acid. Now there are present in the solution sodium arsenite, sodium chloride, a little sodium sulphate and a small quantity of sodium bicarbonate formed from the carbonate that was contained in the sodium hydroxide. To the solution are added 20 Cc. of a saturated solution of sodium bicarbonate, and it is then titrated with a standardized iodine solution. The standard solution of iodine used for all the determinations contained in this paper was of such a strength that 1 Cc. was equivalent to 0.00499 Gm. of arsenic trioxide. The following are the results of ten determinations by the above method:

No. of sample.	Weight of sample.	No. of Cc. I sol. used.	Per cent. of arsenic trioxide
1	0.1409 Gm.	28.15	99.69
2	0.1180	23.58	99.71
3	0.1354	27.04	99.65
4	0.1682	33.62	99.74
5	0.1280	25.58	99.72
6	0.1055	21.06	99.61
7	0.1220	24.35	99.59
8	0.2042	40.80	99.70
9	0.1115	22.25	99.58
10	0.1542	30.80	99.67
	Average.....	.....	99.67

It will be observed that the maximum and minimum results obtained are 99.74 per cent. and 99.58 per cent. respectively, the difference being 0.16 per cent.

By our second method a weighed quantity of the sample mixed with 20 Cc. of distilled water is heated almost to boiling on the hot plate, and while still hot, small portions of a 10 per cent. solution of sodium hydroxide are added until solution of the trioxide is effected. By operating in this way any bumping incident to the boiling of the sodium hydroxide is avoided. After cooling, the alkaline solution is neutralized with $\frac{N}{1}$ sulphuric acid, using phenolphthalein as an indicator. After adding 20 Cc. of a saturated solution of sodium bicarbonate the solution is ready to be titrated in the usual manner. Ten determinations by this method yielded the following results:

No. of sample.	Weight of sample.	No. of Cc. of I sol. used.	Per cent. of arsenic trioxide.
1	0.1112 Gm.	22.20	99.63
2	0.1116	22.30	99.71
3	0.1966	39.25	99.62
4	0.1396	27.90	99.72
5	0.1176	23.50	99.71
6	0.1130	22.55	99.58
7	0.1642	32.80	99.68
8	0.1434	28.64	99.66
9	0.1524	30.45	99.70
10	0.1750	34.96	99.69
	Average		99.67

The maximum and minimum results are 99.72 per cent. and 99.58 per cent., respectively, and the difference is 0.14 per cent. The average of these determinations is identical with that of the ten determinations made according to the first method.

The third method consists in dissolving a weighed quantity of the sample in 20 Cc. of a saturated solution of sodium bicarbonate at the boiling temperature, cooling the solution, neutralizing it with $\frac{N}{1}$ sulphuric acid, using phenolphthalein as an indicator, adding 10 Cc. of the saturated solution of sodium bicarbonate and titrating as usual. This method yielded the following results in ten determinations:

No. of sample.	Weight of sample.	No. of Cc. of I sol. used.	Per cent. of arsenic trioxide
1	0.1313 Gm.	26.20	99.57
2	0.2086	41.68	99.70
3	0.1300	25.96	99.64
4	0.1574	31.40	99.54
5	0.1647	32.90	99.67
6	0.1059	21.15	99.66
7	0.1558	31.14	99.73
8	0.1473	29.40	99.59
9	0.1821	36.35	99.60
10	0.1050	20.96	99.61
	Average		99.63

The maximum and minimum results are 99.73 per cent. and 99.54 per cent., respectively, and the difference between them is 0.19 per cent.

It is perhaps unnecessary to state that the volumetrie solutions of iodine and of sodium thiosulphate used in this work were standardized with extremely great care, every precaution possible having been observed which would tend to increase the accuracy of the work.

Attention may now be directed to the results obtained gravimetrically and volumetrically. We have:

Mean of 2 gravimetric determinations	99.52 per cent.
Mean of 10 volumetric determinations	99.67 per cent.
Mean of 10 volumetric determinations	99.67 per cent.
Mean of 10 volumetric determinations	99.63 per cent.

which shows that the greatest difference between the gravimetric and volumetric determinations is 0.15 per cent. This discrepancy between the two methods may be ascribed to experimental error, but we are inclined to seek its cause in the action of iodine on sodium bicarbonate in concentrated solution as described by Puckner in the Proceedings of the A. Ph. A. for 1904, page 408. However, this question opens up another field of research, with which this particular paper is not concerned.

It is evident that any one of the three methods herein described will give accurate results and requires only a short time to be carried out; but taking time and expedition into consideration, we believe the second method, that is, that one in which the sample is dissolved directly in sodium hydroxide, to be the best. By this method, if one has the standard solutions at hand, it is perfectly possible to make a determination of arsenic trioxide in ten minutes. By the pharmacopœial method at least a day or even longer is required, if the determination is to be made with any approach to accuracy, and it is difficult to understand why the Revision Committee did not adopt some such method as we have described, instead of retaining the old tedious and inaccurate method.

In conclusion, we desire to state that we do not claim originality for the three methods, as the principles underlying them are so simple that it seems as though they must have occurred to others long ago; at the same time a search of the literature has failed to reveal any volmetric method essentially different from that of the Eighth Revision of the United States Pharmacopœia, in view of which fact it has seemed desirable that these methods be published.

St. Louis, August 21, 1905.

The paper was greeted with applause.

Mr. Kebler said he was glad to hear of the method pursued by the authors of this paper; that he had never had satisfactory results with the method of the Pharmacopœia of 1890, and Mr. Caspari, it seems, had had equally poor results with that of the 1880 issue.

The paper was received and referred for publication.

Mr. Caspari said it seemed rather a selfish thing to do, after he had presented his own paper, to move that the other papers be read by title and referred, but the hour was growing so late that he felt it necessary to do this. The motion was seconded by Mr. Stevens and carried.

The following papers were thus read by title and referred:

THE DRUG KNOWN AS PINKROOT.

BY W. W. STOCKBERGER,
Expert in Histology.

The drug known as pinkroot is derived from the American herb called by botanists *Spigelia marilandica*. The date of its discovery is uncertain but it is known that it was taken to England by Bobart in 1694 where it was cultivated. It was not given botanical recognition until 1704 when John Ray described it. Catesby in 1743 made use of the common name Indian Pink by which it was known at that time in America. In 1762 Linnaeus assigned it to the genus *Lonicera*, following Gronovius, but in 1767 took up the genus name *Spigelia* already used in connection with a related West Indian species, *Spigelia anthelmia*. This latter species was discovered before *S. marilandica* and was much used as early as 1751 as a vermifuge by Browne. Catesby in 1743 called attention to the like properties in *S. marilandica*, but it seems clear that the colonists learned the properties of spigelia from the Indians about 1723. The Cherokees valued it so highly that for the whites to be caught digging it was dangerous. Pinkroot was exploited medicinally in Europe in 1754 and admitted to the London Pharmacopœia in 1788. Both species were used for like purposes; they were closely related and were introduced into Europe almost simultaneously, and it can hardly be wondered at that they were generally confused.

Fenuelle in 1823 in working on their chemical properties confused them, publishing his results as obtained on *Spigelia anthelmia* when he really worked on *S. marilandica*. *S. anthelmia* was first investigated in 1826 by Richard Madianna. In spite of this, however, pinkroot was shown to have valuable properties and took an important place in the materia medica of the last century.

To the student of the crude drug market, however, it has long been known that pinkroot, as it appears in commerce, is not a homogeneous article. This is evidenced by the variety of trade names for the different sorts; *e. g.*, Georgia Pink Root, East Tennessee Pink Root, Genuine Pink root, etc. In 1883, Maisch said that the spigelia of 25 years before that time had almost disappeared from the market, its place being taken by smaller roots, among them those of phlox, perhaps of several species. The responsibility for the statement that *Phlox carolina* is used as an adulterant can not be definitely located, but the authority most frequently cited

for the common statement in literature that the foreign admixture present in or substituted for *Spigelia marilandica* is *Phlox carolina*, is Maisch.

Thus for a long time the state of our knowledge of the drug known as Pinkroot has been very unsatisfactory. This extends even to the text-books. Prominent publications on crude drugs figure and describe spigelia in varying terms. The drug seen on the market is equally heterogeneous. This divergence extends to reports on the physiological action. In view of this state of things, it is not to be wondered at that spigelia, once regarded as a highly valuable and reliable drug, should have largely fallen out of use.

To attempt to illuminate somewhat the situation in regard to pinkroot is the object of this paper. The material used for study was obtained in a living condition, planted and grown under observation for three seasons. This has made it possible to see all stages of growth, and to permit careful botanical study and accurate identification. In trying in 1903 to get pinkroot for cultivation several hundred roots were purchased from a party in East Tennessee. The plants on developing were found to differ markedly from spigelia and proved to be *Ruellia ciliosa*, a member of the *Acanthaceæ*. This plant had never appeared in the list of the suspects prior to this time. *Phlox ovata* (*Phlox carolina*) obtained through the courtesy of the Harvard Botanical Garden was also obtained and grown with genuine *Spigelia* and the *Ruellia*. For several years observations had been made on the structure of the plants by Dr. R. H. True, who was carrying on the work before he suggested it to the writer. His study convinced him that the chief part of the crude drug known as pinkroot consisted of a substitute instead of *Spigelia*, and that the substance was not *Phlox* but *Ruellia*. Much more extended investigations by the writer have confirmed this conclusion and have revealed an even more widespread confusion than had been suspected.

Maisch was clearly of the opinion that pinkroot suffered extensive adulteration, and he appears also to have believed that phlox was the adulterant. It also appears that this opinion was based on the identification made by another party. At all events material from Maisch was given to Trimble, who made a study of the underground parts of what he supposed to be *Phlox carolina*, and a body obtained from this source was named "phloxol." Examination of a sample of Trimble's material shows clearly that he worked upon *Ruellia*. Samples sent by Maisch to Greenish were made the basis of an article by the latter on the structure of *Phlox carolina*, in which cystoliths are mentioned as a prominent anatomical feature. After examinations of the original samples no doubt remains that this material was also *Ruellia* instead of *Phlox*. In a recent study of the anatomy of the *Spigeliaceae* by Morelle,* the figures and descriptions

* Morelle, E., Histologie Comparee des Gelsemiees et Spigeliees. Univ. Paris, Ecole de Pharm. These., 1903–4.

given for *Phlox*, an adulterant of *S. marilandica*, have many more important points of agreement with *Ruellia* than with *Phlox*.

This confusion regarding pinkroot has of course involved the physicians who have used so-called pinkroot preparations. To judge from experiments made in this laboratory and elsewhere, *Ruellia* is relatively inert when compared with spigelia, and it is not to be wondered at that the drug has been found unsatisfactory in practice.

Ruellia species grow over an area largely overlapping that occupied by *Spigelia*, and there is a certain general resemblance between the two, but it is hard to see how any drug-collector could confuse them. In *Ruellia* the flowers are borne scatteringly along the stem in the axils of the leaves. In *Spigelia* they are aggregated at the top of the plant in a one-sided spike. In *Ruellia* the pale magenta-colored corolla forms a slender tube below, expanded upward into a broad, flaring limb. The anthers and styles are not protruded. In *Spigelia* the corolla forms a rather broad tube narrowed at the throat, prolonged upward into spreading, narrow triangular portions. The exterior is brilliant cardinal in color, bright yellow on the inside, the styles and anthers are exserted. The leaves of *Ruellia* are bright green, usually short-petioled or sessile, frequently more or less hairy. In *Spigelia* they are dark-green, glossy and sessile.

In the crude drug the forms are separated by less evident gross characters. Ruellia, however, has a coarser, harsher root-system than Spigelia, and the roots show a tendency to lose the cortical tissues, leaving the naked, woody cylinder exposed. Under the microscope the differences are very marked. Cystoliths present in *Ruellia* as a conspicuous feature are lacking in *Spigelia* and in *Phlox carolina*. Starch is present in *Spigelia*, absent in both *Ruellia* and *Phlox*. Powdered Spigelia, therefore, failing to react for starch should be regarded with suspicion.

In closing, attention is called to the fact that it was only through long and familiar observation in the living condition of all species here concerned in all seasons that it has been practicable to uncover fully the true relations involved in the drug called pinkroot.

Bureau of Plant Industry, U. S. Department of Agriculture.

NOTE ON A MODIFICATION OF HEHNER'S TEST FOR FORMALDEHYDE.

BY A. B. LYONS, M. D.

Perhaps the most delicate of all the color tests yet proposed for the detection of formaldehyde in milk is that known as Hehner's contact test. This, as heretofore practiced, is applicable only to milk; at least the fluid to be tested must be mixed with milk or no color is developed. The explanation offered for this is that an essential factor in the reaction is the presence of the milk proteids. It seems, therefore, an obvious improvement in the test to substitute for the milk, unless it is milk itself that is under investigation, beef peptone, which seems much better suited than milk for a laboratory reagent.

I have conducted a series of experiments to determine the practicability of this, and to arrive at a conclusion as to the best way to make the proposed test. The result has been in the highest degree satisfactory, inasmuch as it puts us in possession of a test for formaldehyde exceeding in sensitiveness any other of which I have knowledge.

In Hehner's test this reagent, 2 or 3 Cc. of strong sulphuric acid, to which has been added one drop of solution of ferric chloride (reagent strength), is placed in a narrow test-tube, and the suspected milk is allowed to flow gently down the side of the tube, held in an inclined position, so that the two fluids do not mix to any great extent. If a trace of formaldehyde is present, a violet zone develops just above the plane of contact of the two fluids. In a study recently made of the test by Charles H. La Wall, and read before New Jersey Pharmaceutical Association June 15, 1905, it was shown that the test gave the most distinct reactions with the weakest formaldehyde solutions. The color was very faint at a dilution of 1 :1,000, still faint at 1 :10,000, well developed at 1 :50,000, and strongly so at 1 :100,000. Nothing was reported of weaker solutions.

I made a preliminary experiment, using a solution 1 :1,000 of commercial formalin, containing about 37 per cent. of formaldehyde. I put into a test-tube 5 Cc. of this, added about 50 Mg. dry beef peptone, shook the tube to dissolve this, and then introduced by means of a pipette 1 Cc. of sulphuric acid containing some ferric chloride, allowing the reagent to flow down the side of the tube and underlie the formaldehyde solution. There was developed at once a zone of intense violet-red color, comparable with that of a dilute solution of potassium permanganate. I made a number of tests, varying the proportion of the several reagents, and learned that the result was very strongly influenced by such variations. In some cases scarcely any color at all was produced.

Experiments showed that the color was strong or faint, as the quantity of peptone was increased or diminished. A maximum intensity of color was reached apparently when about 80 milligrams was used to 5 Cc. of fluid. I settled on 50 Mg. as a quantity quite sufficient in testing for traces of formaldehyde. I did not find in any case that an excess of peptone had any prejudicial influence on the result. The quantity of ferric chloride I found to be a matter of very great consequence. Ferric sulphate, indeed, may be substituted for the chloride, and possibly may be found to be equally good. *An excess of ferric chloride*, however, is fatal to the success of the test. On the other hand, a mere trace fails to develop the color. In place of the solution of ferric chloride (reagent) I used with wholly satisfactory results the official tincture of ferric chloride. I found that with moderately strong formaldehyde solutions (*e. g.*, 1 :40,000) the reagent should consist of about one volume of the tincture

in twenty-five of strong sulphuric acid. In case of the more dilute solutions, while the same proportion may be used, it is perhaps better to use one volume of the tincture to fifty or sixty of the acid. In some of the experiments I used 1 :80, apparently with as good results as with 1 :20.

I found that boiling the mixture of reagent with fluid 20 to 60 seconds developed in it throughout a color resembling that produced as a zone in the ordinary way of making the test. In case of highly dilute formaldehyde solutions, the color is rather amber than distinctly red, although when the contact plan is adopted the color zone is distinctly red. I modified the procedure by using equal volumes of reagent and fluid, mixing them by shaking. Without applying more heat, under these conditions, the color develops promptly, and in very dilute solutions seems to indicate approximately the quantity of formaldehyde present. In solutions up to 1 :250,000 the color is amethyst-violet; at 1 :500,000 it still has a predominating violet hue, but verging on garnet. In more dilute solutions the color passes through reddish-amber to apparently simple amber, ceasing to be distinctive. Of course the test in this form would be applicable only to distillates. The presence of organic compounds in the solution would be likely to introduce confusing elements into the color scheme. Negative results would be more convincing than positive, but even such would call for confirmation.

As a contact test, the reagent just described is sensitive almost beyond belief. I started with a solution containing less than 1 :25,000 of formaldehyde. One part of this solution diluted with twenty-four of water (1 :625,000 formaldehyde) gave within ten or fifteen minutes a strong violet zone. Mixed with an equal volume of water, this solution gave within twenty minutes a distinct red zone, which after two hours was as much as 3 Mm. deep, and was of a clear, pale amethyst color. A further dilution to 1 :2,500,000 formaldehyde was yet within the limit of sensitiveness of this reagent. A color zone developed slowly, being quite distinguishable within thirty minutes, and on mixing solution and reagent, the whole assumed the characteristic tint, plainly seen when the tube was viewed obliquely.

This means the possibility of recognizing the presence of *one minim of formalin in seventeen gallons of water.* At a dilution of 1 :4,000,000 formaldehyde, the test comes to a practical limit of its possibilities. A plainly perceptible reddish zone develops within an hour. If formaldehyde is absent, a faint brownish zone is slowly produced, and the presence of organic impurities in the peptone used in the test might easily render this color sufficiently strong to become a disturbing element in solutions of a higher dilution. On the other hand, we might expect to be able by distillation to concentrate an even more dilute solution sufficiently to demonstrate the presence of formaldehyde.

The use of tincture of ferric chloride is suggested for the reason that it is an article always at hand in a drug-store. In any practical work with this or any similar test a blank experiment should always be made on distilled water, also a comparison experiment on water containing 1 :100,000, also 1 :20,000 of ordinary formalin.

In some experiments on milk containing 1 :160,000 formalin it was observed that addition to the milk of some beef peptone brought out the red color much more distinctly than when this was omitted. The test also is more advantageously applied to the whey which separates after adding a few drops of sulphuric acid than to the milk itself. Add the acid, stir together, and in a few minutes transfer to a filter. The filtrate will not be perfectly clear, but sufficiently so to allow color-reactions to be well seen.

In this connection it may be not out of order to call attention to the characteristic *taste* of formaldehyde as a ready means of identifying it when simply in aqueous solution. One drop of formalin diffused in ten gallons of water communicates to the whole the unmistakable flavor of formaldehyde. Perhaps not every person can notice it in this extreme dilution, but one must be deficient in the sense of taste who would fail to detect it in a dilution of 1 :200,000. If the taste is not instantly noticed, there is produced in a few minutes a peculiar impression on the tongue between tingling and numbness which one who has once experienced it will recognize readily. Of course in stronger solutions the acidity can hardly escape notice.

NOTE ON SOME NEW COLOR REACTIONS AND A NEW REAGENT FOR SUCROSE, LACTOSE, ETC.

BY A. B. LYONS, M. D.

A combination of sulphuric acid with a trace of formaldehyde constitutes, as is well known, an exceedingly sensitive reagent for morphine and kindred alkaloids. Conversely, sulphuric acid containing morphine in solution may be used for the detection of formaldehyde. Since there are many other compounds (aldehydes) which react like formaldehyde, the test can have only a limited range of use except as a negative test. However, it occurred to me to try the test by the contact method to find the limit of its sensitiveness. In case of strong aqueous solutions of formaldehyde, *e. g.*, 1 :2,500, the characteristic purple color is easily obtained in this method of applying the test. At a dilution of 1 :10,000 a distinct coloring appears very soon, although the color—a dusky blue—is not what we look for in this test. In case of a solution of 1 :20,000 only a very faint bluish ring develops after some time.

What would be the effect of adding a little ferric chloride to the reagent? The suggestion came from the fact that sulphuric acid containing

a little ferric salt is a most sensitive test for formaldehyde in milk. The experiment was easily tried, with results beyond any expectation. The test applied to a formaldehyde solution 1 :20,000 gave at once a ring of brilliant violet-purple, the whole of the reagent becoming purple-blue.

Applied to successive dilutions of the formaldehyde solution, it gave promptly a color-indication up to 1 :500,000, and a notable reaction when the dilution was carried to 1 :2,000,000.

The reagent is sensitive enough. Is it of any practical value? Naturally the first question is whether a similar reaction is produced by other things besides formaldehyde. Will other aldehydes show the same or similar colors? Experiment showed that they would. Perhaps none show a reaction in so extreme a dilution, but, so far as tried, all react.

One difficulty with the test is that the reagent itself gradually changes color, tending to become spontaneously violet-blue. It may be that the chemical change that produces this result is the same as that brought about rapidly by formaldehyde or sugar. If this should be shown to be the fact, the test would remain one of positive value, since the spontaneous change takes place only very slowly. The test may be modified, to meet this objection, by adding the ferric salt (chloride or sulphate) to the solution to be tested instead of mixing it with the reagent. It loses much of its sensitiveness, it is true, but the acid remains uncolored, so that the ring of violet color is sharply defined, and this is moreover, in successive tests, more uniform in color.

The reagent should always be prepared immediately before it is used. To 5 Cc. of pure sulphuric acid add .010 or .015 Gm. of morphine sulphate and a single drop (from a 1 Cc. pipette) of tincture of ferric chloride, or a corresponding quantity of ferric chloride T. S., or of ferric sulphate (the last conveniently in the form of ferric alum). Put into a narrow test-tube 1 Cc. of the solution to be tested, and add from a pipette 1 Cc. of the reagent, allowing this to flow down the side of the inclined tube.

With an aqueous solution of formaldehyde 1 :50,000 a deep amethyst-colored ring forms at once, the color of the reagent becoming violet-blue throughout. If the two solutions be mixed by shaking, the fluid remains distinctly reddish in color. At 1 :100,000 the reaction is nearly the same, except in intensity in colors. At 1 :200,000 the reagent becomes violet-blue, with an amethystine border above. At higher dilutions similar colors are shown, slower in appearing and less intense, the limit not yet reached at 1 :1,000,000. It is clear that a negative result in applying this test to a distillate from a suspected sample would demonstrate absence of formaldehyde. Even in an undistilled solution a negative result would seem to be conclusive.

The test, however, cannot be applied directly to milk, either before or after coagulation, since sulphuric acid and ferric chloride without morphine

produce a color on their own account. Some experiments were made out of curiosity, with the following results: 1 :200,000, distinct red ring developed within five minutes, the reagent being pale blue below, deeper blue above; 1 :400,000, reddish ring within 15 minutes, color of reagent as in foregoing experiment; 1 :1,000,000, after 20 minutes a suggestion of a reddish ring in the whey of the coagulated milk, the reagent remaining pale blue. Milk containing no formaldehyde, reagent assumed at once a deep purple-blue. The zone above developed slowly an amber color without suggestion of redness. The purple color of the reagent changed from above downward gradually to red. It certainly was curious that the reagent should change to purple in absence of formaldehyde, while it did not so change when there was present an almost infinitessimal quantity of that compound (in one experiment 1 :4,000,000). No importance, however, is attached to any of the immediately foregoing experiments. The reagent, if used at all in the examination of milk, should be applied to a distillate.

As a test for *sugars* the reagent promises to be of real and unique value. The reaction in the case of sucrose is rather distinctive, in that two colors are produced at once. When the solution is strong, *e. g.*, 1 :100, the reagent is immediately colored a violet-blue, bordered above with orange-yellow. The blue gradually changes to violet. If the fluids are shaken together, the mixture becomes brown (caramelization). The reaction at 1 :1,000 is still characterized by the yellow border surmounting the violet-blue of the reagent. The test is especially applicable to the detection of sugar in glycerin, showing easily a quantity as small as two per cent. Glycerin itself produces no color; it is possible that other impurities in glycerin besides sugar might affect the reagent, but it is not likely that any will produce the same combination of colors that sugar does.

The sugar in a syrup or elixir (in the latter case, at least, after evaporating off solvents and volatile bodies) may be made to show its presence by this test. One Cc. of a syrup may be mixed with 500 Cc. of water, and the test applied to the mixture.

In more dilute solutions, sugar produces color changes, but the distinctive yellow border is no longer present. At 1 :2,000 the reagent becomes immediately deep blue, developing a violet border; at 1 :12,000 the reagent becomes quickly pale blue; at 1 :25,000 the change takes place slowly; at 1 :100,000 no effect is noticeable. If sugar and formaldehyde are present together in solution, they may be separated by distillation, or possibly the latter may be made to show itself at a dilution too great for the sugar to interfere.

The color reactions of invert sugar seem to be identical with those of sucrose. No experiments were made with glucose. The test would not be applicable to so complex a fluid as urine, which would probably always contain substances that would develop color with the reagent.

Milk sugar gives color reactions very similar to those of sucrose, except that the yellow border is very much paler; in a dilution of 1 : 100 the border was just noticeable, and it was not certain that the milk sugar was free from sucrose. On the other hand, the violet color is more pronounced than with sucrose.

Milk sugar as well as cane sugar gives the well known reaction with a solution of morphine in sulphuric acid. The color is the same as that produced by sulphuric acid and aldehyde, and similar and identical colors are produced when the morphine is replaced by codeine or heroine. These reactions of morphine and its derivative alkaloids are not new, but they deserve to be better known.

The test is best made by adding to the sulphuric acid a very little of the sugar solution and allowing the mixture to act on the morphine in a dry state.

Addition of some ferric chloride or ferric sulphate to the mixture of sulphuric acid with formaldehyde (or with sugar) used as a test for morphine, modifies very materially the colors produced. In absence of the iron, the color is a vivid purplish-red, approaching indeed cherry-red. In presence of a little iron, the color is dull purplish-blue, the red appearing momentarily as the morphine dissolves, then giving place to the blue. We have thus a play of colors strongly reminding one of that in the well known color test for strychnine, except that the order of succession of the colors is reversed. The color subsequently changes back toward red, becoming ultimately brown before fading out. If a larger quantity of the ferric salt be used, the initial color, after the momentary purple, is greenish-blue to sage-green. Codeine and heroine give essentially the same color effects. What is important to note is that the presence of a trace of iron in the acid used in the formaldehyde test for morphine will modify materially the colors obtained. Discrepancies in the statements of different observers may be explained in view of this fact.

Formaldehyde in conjunction with a ferric salt may be used as an identification test for morphine in the following manner: Dissolve .010 Gm. of the alkaloid in 5 Cc. of strong sulphuric acid, add 1 drop (from a 1 Cc. pipette) of tincture of ferric chloride. Place in a small test-tube 1 Cc. of a solution made by adding 1 Cc. of formalin to a liter of water. Underlay this with 1 Cc. of the above solution, when if the alkaloid were morphine or a morphine derivative the characteristic colors develop in the acid and overlying fluid as already described. Obviously a sugar solution 1 : 500 to 1 : 1000 may be used in place of the formaldehyde solution, and a confirmatory test may be made, using a sugar of milk solution 1 : 100 to 1 : 500.

A CONTRIBUTION TO THE CHEMISTRY OF BOCCONIA CORDATA.

BY J. O. SCHLOTTERBECK AND WALTER H. BLOME.

Bocconia cordata is a hardy, rapidly-growing perennial, attaining a height of 4 to 6 feet. It has been successfully grown in this country, although it is a native of Japan. With us it is commonly known as tree celandine. The material used for this work was grown in Ann Arbor from the seedlings of plants that accidentally crept into the University grounds.

The first reference we find to the alkaloids of Bocconia is in the work of Ernesto Ochoa y Tapia,* upon Bocconia frutescens, in which he found indications of alkaloids, but made no further study.

Eijkman † reported upon the alkaloids of Bocconia cordata, which both he and Hopfgartner ‡ called Macleya cordata, in 1884. He extracted the roots with alcohol containing sulphuric acid, and found macleyine, since proven to be protopine, and sanguinarine. It appears that he did not isolate any other alkaloids.

Rusby § described at some length several species of Bocconia growing in South America, and illustrated the leaves, flowers and fruits of B. cordata, B. frutescens and B. arborea with outline drawings, and the bark of the last two with photographic reproductions. He called attention to the fact that the bark of the fair-sized trees contained a red, acrid, irritating juice, recalling in its physical appearance and physiological effects the well-known Sanguinaria.

J. M. Lasso de la Vega ‖ reported that he had found in Bocconia (species not stated) an alkaloid forming red salts, and called it bocconina, a glucoside, a red coloring matter, a yellowish-red coloring matter, resin, oil and extractive.

Hopfgartner ¶ operated upon 130 to 140 k. of fresh stems and leaves, which were cut up and extracted by repeated maceration and expression with hot water acidulated with hydrochloric acid. The acid-aqueous tincture was evaporated to a small volume, decanted from the extractive which had separated, and a large volume of alcohol added. The alcohol was decanted from the precipitate and distilled, and the aqueous residue made alkaline with potassium hydroxide solution. As the liquid formed very persistent emulsions when shaken with ether or chloroform, recourse was had to an improvised extraction method, using chloroform, whereby

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* Estudio sobre la Corteza del Bocconia frutescens, 1881.

† Rec. Trav. Chim. Pays-Bas, 1894, 3, 182.

‡ Monatshefte für Chemie, 1898, 19, 179.

§ Bull. Pharm., Aug., 1891.

‖ Ligeros apuntes sobre la Boconia y su alcaloide la Boconina: Gaceta Medica de Mexico, 1892, Tom. 28, 367–373.

¶ Monatsh, 1898, 19, 179.

the emulsions were avoided. After distilling off the chloroform, the crude alkaloids were rubbed up with animal charcoal and extracted with carbon bisulphide, which yielded a mixture of alkaloids in the form of a crystalline powder. Another method of purifying the alkaloids, which was later employed, was to take up the chloroform residue with very dilute hydrochloric acid, make alkaline and shake out with a large amount of ether. This yielded the alkaloids in the form of white crystalline crusts. They were finally separated by converting them into the nitrate, which permits of the easy separation of protopine from the remaining alkaloids because of its insolubility in water. Hopfgartner found no sanguinarine in the stems and leaves.

Murrill and Schlotterbeck * found alkaloids in every part of the plant examined, namely, fruit coats, leaf and roots, which latter portion was employed in their work. They extracted the ground drug, which had been moistened with ammonia water and dried in a large, continuous percolation apparatus, with chloroform. The chloroform solution was evaporated to a resinous consistency and taken up with water containing acetic acid. After purification with lead subacetate, it was made ammoniacal and shaken out with ether. The alkaloids were finally separated from each other by a process of fractional crystallization. These authors separated and identified the alkaloids protopine, β-homochelidonine, chelerythrine and sanguinarine, and a fifth melting at 100°. The quantity of the latter was so small that identification was impossible.

We began our work by endeavoring to find a suitable solvent for the alkaloids which at the same time would not remove any great amount of extractive. Menstrua consisting of strong alcohol, eighty and sixty per cent. alcohol, and sixty per cent. alcohol containing two per cent. of dilute hydrochloric acid were used to extract the drug. Portions of the percolate were tested for alkaloid from time to time. So far as power of extraction is concerned, there is but little choice between the first two solvents, but as the strong alcohol removes less extractive we selected that solvent.

Twenty-five k. of the powdered root, which had previously been thoroughly moistened with ammonia water and again dried, was moistened with strong alcohol and packed in a large percolator. Percolation was carried on during the day, while maceration was allowed during the night. As soon as exhaustion was completed the menstruum remaining in the marc was forced out by percolating with about five gallons of water. In all 120 l. of percolate was obtained. The greater portion of the alcohol was recovered from the percolate as it was received, under a partial vacuum, and the thick, syrupy liquid remaining poured in a fine

* Proc. A. Ph. A., 1900, 48, 128.

stream into diluted acetic acid. Upon standing a short time the side and bottom of the bottle was covered with a mass of the crystallized acetate of the alkaloids. These were dissolved by heating on a steam-bath, the solution rapidly cooled, and the supernatant, clear, ruby-red solution filtered from the waxy matter which had separated on cooling. The general method of purifying and isolating the alkaloids was to run 200 to 300 Cc. of the acid alkaloid solution into a large separator, add about twice as much ether, make slightly ammoniacal, shake for a few seconds only, and then rapidly decant the ethereal solution through a plug of cotton into a flask. As some alkaloid always separated out and remained in the separator, the liquid in the latter was acidulated with acetic acid, ether and ammonia water added, and shaken out as before. This operation was generally repeated twice. The separation of ether must be made very rapidly, as the freshly-precipitated alkaloid, while easily soluble in ether, separates from that solvent almost immediately in the form of crystals. Chloroform is a better solvent for the alkaloids, but, because of its great tendency to form very permanent emulsions, cannot well be used. The first substance to separate out upon the walls of the flask is in the form of small warts, one of the forms of protopine. This base may be the only one to separate out for some time, or it may be accompanied almost from the first by a second one in the form of fine needles, depending upon the concentration.

The mixed alkaloids were finally obtained in a fairly pure condition by dissolving them, in small amounts at a time, in acetic acid, making alkaline, and shaking out with ether. This time crystallization was very carefully watched, and the product obtained in 25 to 30 fractions. The first of these consisted of nearly pure protopine, while those remaining were mixtures. By continuing this process of fractional crystallization all of the protopine was obtained nearly free from other bases. In order to obtain it entirely pure it was converted into the sulphate, which has been found to be quite difficultly soluble in water at ordinary temperature, while the sulphate of β-homochelidonine is quite soluble, and filtered through a Buchner funnel. The protopine sulphate was dissolved in hot water, made alkaline, and shaken out with ether. We thus obtained 87 Gm. of pure crystallized protopine.

The second alkaloid to crystallize from the ether solution is β-homochelidonine. Its gross crystalline form varies with the concentration of the solution, appearing sometimes in the form of individual crystals and then in clusters, in which the individual crystals radiate from a common center. The structure of each crystal, whether grouped or single, appears to be always the same. Fractional crystallization was again resorted to, and when completed we had 85 Gm. of pure, well-crystallized β-homochelidonine. From this it would appear that this lot of Bocconia con-

tained its two principal alkaloids in about equal amounts. This proportion has been found to vary more or less, and doubtless depends upon conditions surrounding the plant's growth and time of collection.

A comparatively very small quantity of a mixture of other alkaloids which, according to Murrill and Schlotterbeck, consist of chelerythrine, sanguinarine and a fifth alkaloid crystallizing in fine needles and melting at 100° still remained, but as it was decided to work upon β-homochelidonine, we have not, for the present, concerned ourselves with the separation of these.

β-homochelidonine was first discovered by Selle * in Chelidonium majus in 1889. It received the name because of its similarity to chelidonine, both as to its chemical behavior and physiological action. It has since been isolated by König † from Sanguinaria canadensis; by Wintgen ‡ from Chelidonium majus, and quite probably from Eschscholtzia californica; by Hopfgartner and Murrill and Schlotterbeck from Bocconia cordata; by Fischer § from Sanguinaria canadensis and Eschscholtzia californica, and by Schlotterbeck and Watkins ‖ from Adlumia cirrhosa. It is also quite probable that the bocconine of Battandier ¶ which he found in Bocconia frutescens is identical with β-homochelidonine.

Selle gave to this alkaloid the formula $C_{21}H_{21}N_5$, and König, Tietz and Murrill and Schlotterbeck have adopted the same formula. Wintgen's analyses led to the formula $C_{21}H_{23}N_5$, and Hopfgartner's and Fischer's results agree with it. The alkaloid has two methoxyl groups. It is precipitated from solution by ammonia water and redissolved in excess of the reagent, but is thrown out by a solution of potassium hydroxide. It is optically inactive. Its melting-point is 159°, solidifying again to a resinous mass a few degrees below its melting-point, and then requiring a temperature of 168° to 169° for remelting.

Two other forms of this alkaloid, having the same formula and designated as α- and γ-homochelidonine, having melting-points of 182° and 168° to 169° respectively, are known. Wintgen found that the β-homochelidonine might be obtained from the γ-base, and *vice versa*, depending upon the temperature and the solvent employed, which led him to believe that the two were identical. Fischer believes them to be physical isomers. He succeeded in converting the β-alkaloid by melting, dissolving in warm alcohol and cooling, in part, into long prisms, which melted at 169°. The latter is γ-homochelidonine.

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* Inaug. Diss., Erlangen, 1889; Archiv. d. Pharm., 228, 443 (1890).

† Inaug. Diss., Marburg, 1890.

‡ Inaug. Diss., Marburg, 1890.

§ Proceed. A. Ph. A., 49 (1901), 443, 441.

‖ Proceed. A. Ph. A., 50 (1902), 333.

¶ Compt. Rend., 120, 1277.

To verify these results a small quantity of well-crystallized β-homochelidonine, m. p. 158°, was melted in a small flask suspended in a sulphuric acid bath. This fused alkaloid was recrystallized from absolute alcohol, dried at 90°, twice recrystallized from ethyl acetate, and the m. p. found to be 158°. Dried at 100° for five hours it experienced no loss in weight. A chloroformic solution of it is optically inactive. Crystals obtained from the mother-liquor behaved similarly, except that their optical rotation was not ascertained. A portion of this fused alkaloid recrystallized from absolute alcohol and dried had a m. p. of 168°. Dried in a vacuum desiccator for two days, and in an air-bath for 2½ hours at 100°, this γ-homochelidonine suffered no loss. Crystals obtained from the mother-liquor had the same melting-point, and sustained no loss on drying.

The observation was repeatedly made that β-homochelidonine, which separated rapidly from absolute alcohol, had a m. p. of 158°, while that which separated slowly melted at 167° to 168°. The same substance crystallized from ethyl acetate had a m. p. of 158°, while crystals obtained from the mother-liquor softened at that temperature, but did not melt completely until 169° was reached.

ACTION OF HYDROCHLORIC ACID UPON B-HOMOCHELIDONINE.

For a preliminary trial 2 Gm. of the alkaloid was mixed with 5 Cc. of strong hydrochloric acid in a small flask. The latter was placed in a freezing mixture having a temperature between —15° and —20°. Dry hydrochloric acid gas was conducted into the mixture until solution of the alkaloid was effected. The clear, light-yellow solution was transferred to a bomb tube which had previously been placed in a freezing mixture, and dry hydrochloric acid was passed into the tube to displace the air. It was then sealed and set aside. At the end of two weeks the solution had assumed a somewhat deeper yellow color, but no other change was apparent. As it was quite evident that longer standing at ordinary temperature would induce no reaction, the sealed tube was suspended in a large Erlenmeyer flask, filled with water and gradually heated. The operation was carried out in this way so that we might see the change and ascertain the temperature at which the reaction takes place. In order to avoid accident from possible bursting of the tube, the experiment was carried on in an entirely closed hood provided with two thicknesses of plate glass in front. Heat was applied very slowly under the flask, a temperature of 85° being reached only after three hours' heating. Bubbles of gas were constantly disengaged from the liquid, and when 85° was reached there was a rapid change in the color of the solution, from yellowish to a very dark green. Heat was continued until a temperature of 90° was reached, when the mixture was allowed to cool.

After thorough cooling in a freezing mixture the extreme end of the tube was broken off, leaving a capillary opening which was connected with a nitrometer, and the gas collected, bubbling through, and displacing a strong solution of potassium hydroxide. About 90 Cc. of gas, which we had no difficulty in identifying as methyl chloride, was collected. Having learned the necessary conditions, we worked up larger amounts of the alkaloid, the product of which was used in the next experiments.

The solid contents of the tubes dissolve readily in hot water, and may be purified by passing dry hydrochloric acid gas into this aqueous solution, filtering and drying in a vacuum desiccator. Ammonia water and sodium bicarbonate throw out precipitates which are soluble in sodium hydroxide solution. Ether removes nothing from alkaline solution. Chloroform takes out a small amount of an undetermined yellowish substance.

A benzoyl derivative by the Schotten-Baumann * method was made and purified by pouring the alcoholic solution into a comparatively large volume of ether. An acetyl derivative was also prepared, first with acetic anhydride and later with acetyl chloride, and purified in the same way as was the benzoyl compound. Many gold and platinum salts were made with both of these derivatives. A nitrogen determination of the benzoyl compound gave unsatisfactory results. An acetyl determination of the acetyl compound by the magnesia method † gave good results for three acetyl groups in the compound. From the results obtained it soon became evident that we were not working with a chemical individual, but with a mixture of substances. In the meantime another line of work of a more promising nature had suggested itself, so this experiment was abandoned to be taken up again later on.

THE ACTION OF ALCOHOLIC IODINE UPON B-HOMOCHELIDONINE.

The first reference we find concerning the use of the above reagent for the removal of H from an alkaloid is in E. Schmidt's work upon hydroberberine,‡ which he oxidized to berberine. He used it in converting canadine into berberine hydriodide,§ and Ziegenbien found it to react upon corydaline,‖ forming dehydrocorydaline, and upon corybulbine,¶ upon which it had a similar effect. As four atoms of H were removed in all cases, and the reaction took place very easily and gave close results in the hands of the above-named and other chemists, it

* Baumann, B. 19, 3218.

† Schiff, B. 12, 1531; Ann., 154, 11.

‡ Archiv. d. Pharm., 225 (1887), 154.

§ Archiv. d. Pharm., 232 (1894), 149.

‖ Archiv. d. Pharm., 234 (1896), 490.

¶ Archiv. d. Pharm., 234 (1896), 434.

came to be looked upon as a general reaction. However, the latter chemist later found that the reaction would not take place with either bulbocapnine * or corycavine.† There was a reaction between the alkaloid and the alcoholic iodine in each case, the extent of the reaction being difficult to determine with the former base, and, according to later experiments, the amount of the iodine combined varied within wide limits ‡ with the corycavine, and some of the original base was recovered at the completion of each experiment. The method failing with at least two other compounds, Gadamar and Ziegenbein set about to discover the source of these unlooked-for results, and finally learned that the presence of a small amount, about 0.2 to 0.5 per cent.,§ of hydriodic acid diminished the extent of the reaction between the iodine and the alcohol and increased that between the iodine and alkaloid.

We treated 0.2500 of β-homochelidonine with 50 Cc. of a two per cent. (approximately) alcoholic solution of iodine in a sealed tube, allowed this to stand during 54 hours at room temperature, and then heated at 100° for 2¾ hours. A blank experiment, with the same amount of alcoholic iodine alone, was carried out in the same manner as the one with the alkaloid. The tubes were opened, 2 Gm. of potassium iodide, some sodium bicarbonate solution and an excess of $\frac{N}{10}$ sodium thiosulphate solution added, and the volume made up to 500 Cc. The excess of thiosulphate was found by titrating 200 Cc. samples with $\frac{N}{10}$ iodine solution. The difference in the amount of free iodine between that found in the blank and in the alkaloid experiment was the amount which had united with H withdrawn from the alkaloid. 0.05264 Gm. of I were found to have combined. Calculated for 4H:

$$C_{21}H_{21}NO_5 + 2I_2 = C_{21}H_{17}NO_5.HI + 3HI.$$
$$367.21 : 507.4 :: 0.2500 : x. \quad x = 0.3454.$$

while but 0.05264 Gm. of I were found.

In the following experiments two per cent. alcoholic iodine containing 0.5 per cent. of HI was used. A blank was carefully worked out in each case.

	Sample.	Alcoholic I with HI.	Under press. at 100°.	Iodine combined.	Calculated for 4 H.
1.	0.2500	50 Cc.	3½ hr.	0.07473	0.3447
2.	0.2500	40 Cc.	8⅓ hr.	0.1795	0.3447
3.	0.2000	30 Cc.	20½ hr.	0.0319	0.2757

* Archiv. d. Pharm., 234 (1896), 523.

† Archiv. d. Pharm., 234 (1896), 531.

‡ Archiv. d. Pharm., 240 (1902), 28.

§ Archiv. d. Pharm., 240 (1902), 31.

From these experiments we concluded that the reaction does not apply with the alkaloid in hand.

THE ACTION OF PCl_5 UPON β-HOMOCHELIDONINE.

A number of preliminary trials were made with small amounts of material. 1 Gm. of the alkaloid was dissolved in 7 Cc. of dry chloroform, to which, contained in a flask connected with a reflux condenser, was added 1 Gm. of PCl_5. There was but slight reaction, and most of the alkaloid was recovered unchanged. The m. p. indicated a large proportion of γ-homochelidonine. Other attempts were made using the same amount of alkaloid and varying amounts of solvent and PCl_5 and heating in a flask as before, but free alkaloid, consisting of a mixture of the β- and γ- varieties, was always recovered. As the reaction conducted in this way affected but a small part of the base, a chloroformic solution of 1 Gm. of the latter was treated with a mixture of 3 Gm. PCl and heated at 70° under pressure for an hour. To see what change longer heating and a higher temperature would induce, this tube was heated at 100° for two hours, and then at 130° for two hours more. After opening the tube and separating the solid substance from the chloroform it was dissolved in hot water, from which well-formed crystals separated on cooling. In this case we were unable to recover any of the original alkaloid, indicating that all had been acted upon by the PCl_5. An attempt was next made to find the most favorable conditions under which to carry out this reaction. One Gm. of alkaloid, contained in each of several bomb tubes, was dissolved in 8 to 10 Cc. of dry chloroform, and varying amounts of PCl_5 added. One of these was heated in a deep glycerine bath at 80° to 90° for six hours. The second and third were heated in a furnace at 85° for 20½ hours, when the second was removed. The third was again heated, this time to 115°, for 9½ hours, making 30 hours' heating in all.

The reaction product was in all cases a yellow solid body, soluble in water, alcohol, all mixtures of alcohol and water, chloroform, wood alcohol, aceton, amyl alcohol; sparingly soluble in ethyl acetate, and nearly insoluble in ether. Ammonia water causes a transient cloudiness with the solution, but no permanent precipitate. An ammoniacal solution soon becomes very deep purplish-red. Such a solution shaken with hot chloroform or with amyl alcohol in the cold yields a substance to these solvents which may be quickly thrown out as a yellowish-white powder by the addition of a large volume of ether. We have not yet obtained the free base in a crystalline form.

For subsequent experiments the alkaloid was dissolved in about ten times its weight of dry chloroform and treated with two and one half times its own weight of PCl_5, and heated under pressure in a furnace at 90° to 100° for 5 to 6 hours. The contents of the tubes was then transferred

to an evaporating dish and evaporated to dryness to expel the chloroform and hydrochloric acid, and then dissolved in hot water and allowed to cool and crystallize. This was then recrystallized from alcohol at first and then from alcohol to which ethyl acetate, short of precipitation, had been added. The color of the crystals was still reddish-yellow in mass, and they were therefore thought to carry impurity. The substance was then thrown out by pouring a hot, concentrated alcoholic solution of it in a fine stream into ½ to 1 l. of cold ether. After the subsidence of the light yellow powder the mixture was filtered with the aid of a pump through a Buchner funnel, and immediately washed with cold absolute ether. The washing with ether was found necessary to get a light product, as the traces of alcohol remaining mechanically mixed with the residue, being less volatile than ether, exercise a slight solvent effect and cause the compound to assume a yellowish-brown color. After purification in this manner the compound was crystallized from absolute alcohol.

A small amount of this pure substance was dissolved in water and boiled with animal charcoal without decolorizing it in the least. Another portion was precipitated with Mayer's solution, the precipitate suspended in water and decomposed with H_2S, made alkaline and finally shaken out with hot chloroform. The residue was again of a light yellow color, proving that the alkaloid is a colored one.

The principal portion of the product came out in crystals of a single form, but this was mixed with a small quantity of differently-shaped crystals, which generally formed in radiating groups. These were quite easily separated mechanically, and the remainder of supposedly pure substance again crystallized from absolute alcohol. This yellow crystalline compound as finally obtained melted completely with decomposition at about 198°.

As the compound gave reactions for Cl, determinations of that halogen were made according to Pringsheim's method by oxidizing the alkaloid with sodium peroxide. This method was used, as it was thought possible that a replacement of Cl for OH had taken place. The method was, however, proven at this time to fail almost completely in oxidizing another, probably closely related, alkaloid, and as it gave results for approximately but one atom of Cl in this case, the method of Carius, using 2 Cc. of fuming nitric acid and heating to 300°, was employed. The results from the two methods were identical, although with the second method the alkaloid was completely oxidized. Two determinations were made for HCl, combined with the base to form the hydrochlorate, by dissolving the latter in water and precipitating with silver nitrate in the usual way. The results again were identical with those previously obtained. The conclusion, therefore, is that the hydrochlorate of the

alkaloid was formed during the reaction, and that no Cl was substituted in the molecule.

A number of combustions for C, H and N were made, but although they agreed fairly well among themselves, would not harmonize with any formula that would answer for Cl. The same must be said of the platinum compounds obtained. It is quite possible that we have here a condition such as obtains in the production of cotarnine upon the decomposition of narcotine and of hydrastinine from hydrastine, that a basic as well as a second, possibly acid, product results from the action of PCl^5 upon the alkaloid, and that the nucleus of β-homochelidonine is isoquinoline.

As the material at our disposal is now exhausted, this part of the investigation will have to rest until more material can be obtained.

Several attempts were made to obtain an acetyl compound of B-homochelidonine with both acetyl chloride and acetic anhydride to determine the presence of OH, but so far these attempts have not been successful.

A small amount of β-homochelidonine was fused with potassium hydroxide. The fusion gave reactions indicating protocatechuic acid. Lack of material prevents further work in this direction at this time.

ACIDS OF BOCCONIA CORDATA.

Murrill and Schlotterbeck extracted Bocconia which had been moistened with ammonia water and dried, with chloroform. The marc was percolated with water and the percolate run down to a small volume. In this way a small quantity of a dry, dirty, gritty powder and a thick liquid containing the ammonium salts of the acids of the drug were obtained and placed aside for the time.

As much of the powder as possible was dissolved in boiling water, strained through cloth and filtered. The residue was dissolved in hot dilute hydrochloric acid, boiled with purified animal charcoal and filtered. This filtrate was found to consist mostly of calcium phosphate.

The aqueous percolate contained a large amount of nearly black, gummy matter, which was thrown out by pouring the aqueous liquid into a large volume of alcohol and decanting. The alcohol was recovered by distillation and the solution evaporated to about 250 Cc. This was then mixed with about ten times its volume of alcohol and set aside to crystallize. After standing for several days at a temperature of about —18° (0° F.) the entire surface of the flask became covered with beautiful hexagonal, microscopic, transparent crystals. We have not had time as yet to ascertain their identity.

SCHOOL OF PHARMACY, UNIVERSITY OF MICHIGAN, *June, 1905.*

ALOES AND THE U. S. P.

BY M. I. WILBERT,

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Aloes, as presented in the recently issued 8th decennial revision of the Pharmacopœia of the United States of America, is such an evident illustration of the necessity for taking into consideration the history, as well as the present status of our knowledge of the several official drugs, that a review of this subject may well be considered as being opportune at this time.

There are but few drugs in our list of the vegetable materia medica that are more widely known or more widely used, and few indeed that have a more interesting history, than aloes. Aloes has been in use from times immemorial, and is mentioned in every treatise on the vegetable materia medica known at the present time.

At an early date it was recognized that there were different varieties of the drug, and also that these different varieties differed not alone in physical properties, but also in their physiologic or medicinal action.

For the object immediately under consideration, however, it will not be necessary to delve deeply into the ancient history of this drug, and we will therefore confine our review to the history of aloes as it appears in the several editions of our national Pharmacopœia and its immediate predecessors.

In the Pharmacopœia of the Massachusetts Medical Society, published in Boston, in 1808, we find under the general heading "Aloes" two subheadings, (a) Hepatic Aloes and (b) Socotrine Aloes. In all of the preparations in this early pharmacopœia, wherever aloes is mentioned, Socotrine aloes is specified.

The Pharmacopœia of the New York Hospital, published in New York in 1816, retained practically the same definition, and also specifies Socotrine aloes in all the official preparations, with the single exception of aloetic pill, where aloes, without further specification, is directed to be used.

In the first edition of the Pharmacopœia of the United States of America, published in Boston, in 1820, we find two headings:

1. Aloe Socotrina from Aloe Spicata.
2. Aloe Barbadensis from Aloe Vulgaris.

All of the preparations containing aloes are directed to be made from Socotrine aloes.

The first revision of the U. S. P., published in New York, in 1830, retained the two kinds of aloes, but changed the definition to Aloes Spicata, Socotrine Aloes, and Aloes Hepatica, Barbadoes Aloes. This edition of the U. S. P. was unique in that, in addition to giving the dose and the medicinal properties of the various drugs, it also contained a fairly accurate description of the physical properties. Socotrine aloes, for instance, is described as occurring "in small pieces of reddish-brown color, assuming when pulverized a deep bright yellow; hard, brittle, fracture conchoidal

and glassy; odor strong and somewhat fragrant; taste intensely bitter, with a slight aromatic flavor; soluble in diluted alcohol.

Hepatic Aloes is described as occurring "in large masses of darker color than the Socotrine Aloes, when powdered of a dull olive-yellow, odor very disagreeable, taste extremely bitter and nauseous."

The interesting portion of this early description of course is to be found in the fact that at that time, just seventy-five years ago, the importance of calling attention to the macroscopic appearance of powdered drugs had already manifested itself. The preparations of aloes in the first revision of the U. S. P. were all directed to be made from Socotrine Aloes.

In the Philadelphia revision of the U. S. P. published in 1831, the definition for aloes is restricted to: Aloe, Aloes, Aloe Spicata, thus retaining only what was then known or used as Socotrine Aloes. In harmony with the official definition the formulas of the official preparation of aloes were changed to read "aloes" in place of Socotrine aloes.

The first edition of the United States Dispensatory, in commenting on the subject of aloes, says: "Much of the aloes sold as Socotrine has never seen the Island of Socotra, nor even the Indian Seas. It has been customary to affix this title as a mark of superior value to those portions of the drug, from whatever source they may have been derived, which have been prepared with unusual care and are supposed to be of the best quality."

The Journal of the Philadelphia College of Pharmacy, for April, 1831, in a review of this pharmacopœia, in commenting on the definition for aloes, says: "The convention has given the Aloes Spicata as the plant yielding aloes. We presume that they mean to designate the Cape Aloes as the official species, that being almost the only kind brought to this country. The former convention followed the London College in giving Socotrine Aloes and Barbadoes Aloes, and referring the former to Aloes Spicata and the latter to Aloes Vulgaris. In the uncertainty which exists as to the origin of the different species of this drug, no arrangement can be regarded as permanent." That the practices differed, in New York and in Philadelphia, would appear from the description for Socotrine Aloes in the New York Pharmacopœia for 1830, which would hardly apply to any Cape Aloes as found in this market at the present time.

In later years Cape Aloes did, however, become recognized as the only official variety and practically the same definition for this drug was retained in the Pharmacopœia for 1840, which reads: Aloe, Aloes. The inspissated juice of the leaves of Aloe Spicata, and other species of Aloe. During the next ten years, owing to the rapid development of American trade with the Far East, an ever-increasing amount of true Socotrine was brought to this country. The committee appointed to revise the pharmacopœia, in 1850, recognizing the necessity for taking cognizance of this change, added Aloe Socotrina (Lamarck) to the definition or description of aloes, in the pharmacopœia for that year. The work of the committee on re-

vision, in 1860, if not dominated, was largely influenced by the knowledge and opinions of two men that have had more than a passing influence on the pharmacy of this country. These two men, Wm. Procter, Jr. and Dr. E. R. Squibb, were possessed of more than the average amount of knowledge concerning the origin and uses of drugs and much of the advance that was made, in the Pharmacopœia for 1860, was directly due to their influence and suggestion. Dr. Squibb, particularly, had devoted considerable attention to aloes and it was directly due to his practical experience with this particular drug that the changes that were embodied in the Pharmacopœia for 1860, were made.

In the Pharmacopœia for 1860 we find three varieties of aloes enumerated:

Barbadoes Aloes. The inspissated juice of the leaves of Aloe Vulgaris (Lamarck).

Cape Aloes. The inspissated juice of the leaves of Aloe Spicata (Thunberg) and of other species of aloe.

Socotrine Aloes. The inspissated juice of the leaves of Aloe Socotrina (Lamarck).

The preparations of aloes enumerated in this edition of the Pharmacopœia are directed to be made from Socotrine Aloes. In this same Pharmacopœia we also find, under Aloe Purificata, directions for purifying Socotrine aloes. This preparation was introduced at the suggestion of Dr. E. R. Squibb who demonstrated the necessity for separating out the extraneous matter that, accidently or otherwise, found its way into Socotrine Aloes, in the course of its preparation.

The Pharmacopœia for 1870 retained the same definitions for aloes that were included in the Pharmacopœia for 1860.

A radical change in the official status of aloes was made by the U. S. P. revision committee for 1880. In the Pharmacopœia for that year Cape and Barbadoes aloes were dismissed, and all of the preparations of aloes, with the single exception of extract of aloes, were directed to be made from purified aloes. Barbadoes aloes was discontinued because it was not thought fit for use by human beings, and Cape aloes had, owing to the Zulu war, become so scarce and high in price as to be almost prohibitive. Socotrine aloes, on the other hand, was comparatively plentiful, but of poor quality, being frequently contaminated by the accidental admixture of a great variety of foreign substances. Purified aloes, that in 1860 had been added to the Pharmacopœia for the benefit of such medical practitioners as wanted or desired to use a purer or better preparation than the aloes of the market, was now, as a matter of necessity, directed to be used in all pharmacopœial preparations, with the single exception of the extract noted above.

Dr. E. R. Squibb, the originator of purified aloes, in a review of the subject published in "An Ephemeris" in 1884, says: "There is no doubt

that the process injures the aloes by heating, and as knowledge increases in the countries where it is produced, the inducement of higher prices for a better article may yield it to those who are willing to pay for it, and thus save the cost of the straining process."

The pharmacopœial revision committee for 1890 closely followed the precedent established by the preceeding Pharmacopœia, but readmitted Barbadoes aloes and also admitted aloin, which, though known and quite extensively used in 1880, was not considered; it being asserted that aloin was no better than a good quality of aloes.

Cape aloes, though quite plentiful and of good quality, had not been able to re-establish itself in this country in 1890, and was therefore not considered.

The present eighth decennial revision of the Pharmacopœia of the United States of America, under the general heading, Aloe: Aloes, includes, in brackets as synonyms, Aloe Barbadensis, Aloe Socotrina, Pharm. 1890. The present Pharmacopœia defines the drug as being: "The inspissated juice of the leaves of Aloe Vera (Linne) Webb, Aloe Chinensis Baker, Aloe Perryi Baker, or other species of aloe (Fam. Liliaceæ)."

The Pharmacopœia further requires that the drug occur: "In yellowish-brown or orange-brown opaque masses; translucent in thin fragments; fracture uneven, dull and waxy, somewhat resinous, or smooth and glassy, somewhat conchoidal; occasionally exhibiting microscopic crystals of aloin; odor characteristic; taste nauseous, bitter." In addition to this description of the physical properties of aloes, the present Pharmacopœia also prescribes a number of chemical tests that the official drug must respond to.

The preparations of aloes are to be made, as heretofore, from purified aloes, which in turn is directed to be prepared from aloes; presumably only from the variety of aloes that will meet with all of the official requirements and tests.

The shortcomings of the present definition are not alone numerous, but are in addition quite serious. The following are among the more evident of these shortcomings:

1. The official description of the drug does not contain an accompanying description of the powdered drug. In 1884, Dr. E. R. Squibb, in commenting on the shortcomings of the Pharmacopœia for 1880, said: "Aloes is rarely seen by the physician or pharmacist in any other condition than that of powder, as it is almost universally bought in powder from the wholesale dealer or drug miller. Hence the Pharmacopœial description of it in masses is not of great importance except to those who have it powdered." That this criticism, true twenty years ago, still holds good, will be evidenced by every retail pharmacist in the country, as there are few drug stores indeed where even a sample of lump aloes can be found.

As an indication of the present status of the art or science of pharmacy

in this country, the failure to include descriptions of powdered drugs, in the latest revision of the U. S. P., is to be deplored, as it would indicate that the attainments of American pharmacists do not compare well with the attainments and ability of the pharmacists of Germany, Sweden and even of Russia. The Pharmacopœias of these three countries do have, and the coming Pharmacopœias of Switzerland, Austria and France will have concise but very complete and satisfactory descriptions of powdered drugs.

2. The first, and most prominent, chemical test restricts the official drug to one containing isobarbaloin. This test practically limits the U. S. P. description of aloes to the so-called Barbadoes aloes, as both the true Socotrine, as well as genuine Cape aloes do not give the prescribed reddish color with nitric acid.

As it is still possible to find, among American medical men, physicians who hold that Barbadoes aloes may be good enough for horses or cattle but not fit for use by human beings, this is a point that should be brought to their attention so that they may, if they feel so inclined, specify the Socotrine aloes of the U. S. P., 1890.

3. Probably the most serious error in connection with the official requirements for aloes is the fact that other preparations are directed to be made from purified aloes. The retention of purified aloes, particularly in view of the fact that the West India variety of aloes is the only one that will meet with the Pharmacopœial requirement is, in itself, a mistake, and to direct that other official preparations be made from one that has been unnecessarily enhanced in value and reduced in efficiency is not consistent with good business principles. The introduction of purified aloes, more than forty years ago grew out of the desire of several physicians to commend a preparation of Socotrine aloes reasonably free from the thousand and one kinds of foreign substances that might drop, or were thrown into the semi-solidified aloes as it was being evaporated or dried in the open air. The use of purified aloes, twenty years ago, was a supposed necessity, born of the war with the Zulus, in South Africa, and the accompanying scarcity of really first quality East Indian or African aloes. The retention of this practice, in the Pharmacopœia for 1890, was undoubtedly a mistake that is now made all the more evident by the ultra-conservative action of the present committee on revision.

A much more rational solution of the necessity to insure a reasonably pure quality of aloes, and one more in harmony with the present status of the drug and also more in keeping with the admittedly scientific character of the chemical portion of the latest revision of the U. S. P., might have been secured if the Committee on revision had devoted some attention to the history of the subject as depicted in the earlier editions of the Pharmacopœia and in place of retaining purified aloes had defined a reasonable limit for the alcohol-insoluble matter and also a limit for the residual ash,

somewhat in keeping with the requirements of the German Pharmacopœia, published five years ago.

OUTLINES FOR THE SAMPLING OF DRUGS AND CHEMICALS.

BY LYMAN F. KEBLER.

The importance of procuring representative samples for analytical work is overlooked and underestimated only by those who have never had any practical experience. Its value, however, is known to those who have had the pleasure of seeing their results confirmed by a referee because sampling was properly performed and those who have been unfortunate enough to find that their results were "off" because of careless sampling. Probably many of us have experienced both. The observations embodied in this paper are gleaned from practice and are presented here with the view of assisting in bringing about some uniform system of sampling and, if possible, to save some of the younger chemists many trying and at times embarassing experiences.

The procuring of uniform samples is the first important step in securing uniformity in chemical analysis. So long as we are not certain of obtaining samples which represent the total average of the material of a given consignment we can never be positive that the analytical results can be relied on as truly setting forth the quality of the goods delivered. Non-representative samples are worse than worthless.

Recommendations for the sampling of butter, cheese and soils are contained in Bulletin No. 45 of the Bureau of Chemistry entitled "Methods of Analysis." The general principles involving the proper sampling of ores have been thoroughly treated by several writers.*

One of the factors that contributes largely to the uncertainty of obtaining average samples is the practice in commerce of entrusting most of the sampling to workmen, who do not realize the importance of this duty, are frequently indifferent and exercise little judgment. For example, the containers in which the material is placed, after preparing the samples, have not been well cleaned, thus detracting from the physical appearance of the article; or rinsing a bottle out with water and neglecting to dry the same before taking a sample of oil; or placing a sample of bleaching powder in a wet bottle, or allowing the uncorked bottles containing effervescing or deliquescing material to stand around several days before the same are transmitted to the chemical laboratory, or disregarding instructions relative to the manner in which the samples should be taken, et cetera. It can readily be seen that it does not require any discriminating intelligence to minimize the above disturbing factors, but this nevertheless demands definite plans of procedure. To accomplish this it is imperative for the

* A. N. Tate, J. Soc. Chem. Ind., 1884, *3*, 339; E. Keller, J. Am. Chem. Soc., 1897, *19*, 243; Wm. Glenn, Trans. Am. Inst. Min. Eng., 1891, *20*, 155.

chemist himself to learn how to take samples properly and when the chemist is accomplished in the art then he can instruct a reliable person, in detail, by example, how to collect samples. The analyst himself should take samples in person from time to time and at unexpected moments when samples are being taken, "turn up" and make a careful inspection.

The second and most important part to consider is the method of sampling and the number of samples to be taken from each delivery or purchase. The procedure which will reduce the disputes that may arise to a minimum is to adopt definite schemes for sampling (such as are outlined below), sample each package and analyze each sample. Such a procedure, however, is in the vast majority of transactions a commercial impossibility. Yet it is at present the common practice with a commodity like opium. In the writer's experience no hard-and-fast rules can be laid down to govern all sampling. Good judgment plays an important part. Points that should be duly considered are: the brand, the manufacturer or producer, serial numbering of the packages, physical appearance of several successive samples taken and previous experience with the goods in hand. The writer experienced very little friction by taking samples from every fifth package with such goods as acetanilide, benzoic acid, calomel, carbolic acid, citric acid, copper sulphate, copperas, fixed oils, flaxseed meal, formaldehyde, glycerine, milk sugar, nux vomica beans, oxalic acid, petrolatum, quinine sulphate, soda ash, sodium phosphate, etc.

The containers holding the samples and the original packages must be carefully marked for identification. The amount taken from each package was about 200 Gm. The samples were then carefully examined physically and, if no difference could be detected, approximately one-half of each sample was removed to form a single composite sample. After thoroughly mixing this composite sample a sufficient amount was taken for analysis and a suitable amount set aside for future use. If, on the other hand, any difference was detected, several of the samples were tested and if any abnormality was noted either the entire consignment was rejected or each sample was tested separately. Before either of the above procedures was put into effect the consignor was informed as to the findings and was usually given the option of having the goods rejected en masse or paying for having the samples tested individually.

It is self-evident that where only every fifth package is sampled the possibility of accepting some inferior goods is greater than when every package is tested, but even the latter procedure does not ensure positively against this, when the usual methods of sampling are followed. For example, on examining a carload of flaxseed meal it was found that a goodly number of barrels contained an A No. 1 product in the marked end of the barrel, but the unmarked end was filled with a mineral-oil-saturated product. Such a reprehensible method is not often met with, and it was only by exercising eternal care and vigilance that it was discovered.

The "one in five plan" of sampling has its defects. For example, if 25 per cent. of a delivery of olive oil is adulterated to the extent of 25 per cent., it is in the first place possible to miss the adulterated goods entirely, and in the second place it is quite probable, even if a fair proportion of the adulterated goods are sampled and a composite sample is made, for the analyst to miss such a small per cent. of foreign material.

In the case of high-priced goods such as opium and some of the essential oils and chemicals to be used in quantities proportionate to their strength, in the manufacture of other commodities, every container should be tested. The reasons are obvious.

Other essential points to be considered are: first, the physical properties of the goods, whether viscid or semi-viscid, crystalline, powdered, whole or partly broken or cut such as roots, leaves, barks and beans; liquids and products that become liquified on raising the temperature; second, the containers in which the goods are handled commercially, such as barrels, bags, bales, pockets, boxes, carboys, open and sealed iron drums, etc. In order to meet these conditions the following classification based on the average commercial package may be followed:

1. Gums and Gummy Substances: Asafetida, benzoin, Curacao aloes, myrrh, opium, etc.

2. Large Crystals and Crystalline Masses: Ammonium carbonate, copper sulphate, corrosive sublimate, potassium cyanide, sodium carbonate, etc.

3. Powders and Small Crystals: Acetanilide, arsenious oxide, bismuth subnitrate, bleaching powder, charcoal, cinchona bark, ipecac root, gum arabic, wild-cherry bark, etc.

4. Crude Vegetable Drugs: Aconite root, belladonna leaves, bloodroot, coca leaves, cubeb berries, nux vomica beans, vanilla beans, etc.

5. Liquids: Acetone, alcohol, ammonia water, balsam copaiba, glycerin, sulphuric acid, turpentine, etc.

6. Articles that congeal in part or as a whole at moderately low temperatures: Oils of anise seed, eucalyptus, peppermint, sassafras, glacial acetic acid, etc.

7. Solid at ordinary temperatures but liquify on warming: Carbolic acid crystals, beeswax, ceresin, Japan wax, petrolatum, paraffin, spermaceti, etc.

This classification will now be taken up seriatim.

1. Gum opium comes in globular or subglobular lumps packed with Rumex seeds in tin-lined wooden boxes, and the sampling should be conducted as follows: The cases containing the lumps of opium should be carefully opened and the tin lining the same should be cut and bent with as little mutilation as possible, so that it can be returned to its original position and soldered if necessary. From every fifth lump a conical section should be taken in such a manner that the apex of the cone approxi-

mately comes from the centre of the lump, and the amount of the surface of the cone should approximately bear the same proportion to the entire surface of the lump that the whole cone bears to the sphere. With a little practice these samples can be cut very accurately. The size of the cones should be such as to approximately give the desired amount of material necessary for analysis, and at the same time sufficient should be left so that the chemist can retain a portion for future use, if necessary. For duplicate analysis, according to the present U. S. Pharmacopœia process, 20 Gm. will be necessary. In order to have a sufficient amount left for the chemist's reserve sample and to provide for contingencies, it is desirable to take from each package approximately 120 Gm.

Aloes, Curacoa, comes in tin cans holding about fifty pounds, two cans being packed in one case. Samples should be taken from both cans of every fifth case by cutting a two-inch circular hole at the top near a corner formed by three planes. Through this opening the contents are thoroughly mixed by means of a strong, smooth stirring rod, then the sample is withdrawn either by pouring off or by using the stirrer; at times, though, aloes is too stiff to mix in this manner, then it becomes necessary to warm the cans; even then the contents of some packages will not liquify sufficiently to thoroughly mix. In such cases it is best to take one sample through the center of the can by means of a tryer.

Asafetida is delivered in 400 hundred pound cases in lumps, more or less massed together. Small pieces must be taken from many separate lumps and all parts which show some difference in physical appearance. The size of the piece should approximately be proportionate to the size of the lumps from which they are taken. In sampling, the finer material, if present, should be remembered. The pieces must then be thoroughly broken up either in an iron mortar or strong iron mill, thoroughly mixed and about one pound placed in a bottle for a sample.

The cases of gum benzoin usually contain about 140 pounds and the sampling should be conducted as for asafetida. The fine portion should, however, not be forgotten.

2. Large Crystals and Crystalline Masses come in boxes, barrels and sealed iron drums. In every case each package sampled should be fully opened for inspection. This gives a much better idea of the physical appearance than could be obtained from a small sample. About one pound of material should be taken from each package sampled and finely powdered before testing.

3. Powders and Small Crystals. With this form of material it is necessary to take into consideration the kind of containers, such as barrels, boxes, bins, sealed drums, and at times heaps must be sampled. Barrels, sealed iron drums and boxes should be sampled by taking not less than one pound from both ends of the container. The two places of sampling should be as far from each other as possible. The material thus withdrawn

must be thoroughly mixed and a suitable amount of this mixture taken for a sample. The number of packages to be sampled in this manner will depend on the size of the consignment, the value of the article to be tested and other factors enumerated above. One of the best ways of taking samples from packages of this character is to bore or cut a two-inch hole into the ends and through this opening introduce a tryer, such as is used in sampling cheese, give the same a circular turn and withdraw the material by having the convex portion of the tryer at the bottom of the opening. The openings are to be closed with suitable stoppers or small pieces of tin nailed over them. Heaps can best be sampled by horizontally thrusting a two-inch tin tube, of suitable length, into the material at about a half-dozen different places, removed as far from one another as possible. thoroughly mixing the several withdrawals and taking such an amount of the mixture for a sample as may be necessary. The proper sampling of bins presents numerous difficulties chiefly on account of inaccessibility. The procedure must be governed by the conditions that obtain in each case. Sometimes it is possible to bore holes in the bins but frequently this is neither possible nor feasible.

4. Crude Vegetable Drugs usually come in bales, pockets, barrels, bags, kegs and boxes. In the case of bales, pockets and bags, about half-pound samples should be taken from the top, bottom and near the middle, mixed and placed in receptacles carefully numbered. Barrels, kegs and boxes must be opened by removing the heads or covers and thoroughly inspecting their contents as to physical appearance and foreign odors such as mustiness. It is at times desirable to take out both heads of a barrel or empty it entirely. One end is at times materially different from the other end. The number of packages to be sampled must be determined by their size and the nature of the material to be examined. Packages containing from 300 to 400 pounds should all be sampled, especially potent remedies. With drugs that are liable to considerable variation every package should be sampled and tested. With some goods it is sufficient to sample every fifth package. If the samples are sufficiently dry they should be coarsely ground with an iron mill, completely dried at 100° C. and reduced to a number 40 powder. This procedure ensures a uniform sample.

5. Liquids are delivered in barrels, iron drums and carboys. There is usually no difficulty in taking samples from these containers by pouring, but it should be borne in mind that liquid preparations often contain sediments or suspended material due to recent agitation, either present in the original material or derived from a dirty container. It frequently happens that the upper portion is perfectly satisfactory, but the bottom is contaminated with foreign material, and, therefore, is not salable, but a source of loss. Before taking samples from liquid preparations the containers, opening at the top, should be allowed to remain quiet from 24 to 48 hours, depending on the nature of the material. The sample should then

be withdrawn from the bottom by means of a siphon, which is started by using a portion of the liquid at the top of the container. Conditions at times and the nature of the substance (glycerine), sometimes precludes this procedure, then it becomes necessary to remove the material from the bottom of the package by using a glass tube, from ¾ to 1 inch in diameter, constricted at one end so that a rubber tube with a pinchcock can be slipped on. When ready to take the sample, close the pinchcock, lower the open end of the tube to the bottom of the container, open pinchcock, allow the tube to fill, either by gravity or suction, close the pinchcock, withdraw the tube, and carefully place its contents in a suitable receptacle. Repeat the operation until a sufficient amount is collected.

6. Articles that congeal in part or as a whole at moderately low temperatures. Considerable care should be exercised in taking samples from this class of goods to see that the contents of a package are completely liquefied and thoroughly mixed. For example, if a can of sassafras oil has congealed, the heavier portions are usually at the bottom and it is not sufficient to liquefy the oil, but it becomes imperative to thoroughly mix the same by mechanical means, such as stirring. If shaking is resorted to the containers must be partially emptied before so doing, otherwise unsatisfactory results will be arrived at. Pouring from one can to another is a good procedure. In the case of sassafras oil it frequently becomes necessary to examine every can, but usually the testing of every fifth container gives satisfactory results. What has been said about oil of sassafras holds for the other oils, but is not so conspicuous in some cases. On allowing congealed glacial acetic acid to liquefy slowly the first portion liquefied is usually more dilute and contains a larger proportion of the impurities than the portion still congealed. Unless this point is borne in mind, unreliable results may be obtained.

7. Goods solid at ordinary temperatures but liquify on warming. Of this class carbolic acid crystals form a good example. This chemical is usually collected in tin or galvanized cans, holding about 300 pounds, and allowed to cool. In so doing the portion of lowest melting-point is forced to the centre, where it finally congeals, or, sometimes, remains liquid. To secure a representative sample it will be necessary to melt the contents of the cans by placing them in a hot room or hot water above 50° C. for several days. A circular hole about 8″ in diameter is then cut into one end, the liquefied carbolic acid thoroughly mixed with a strong glass or brass rod and the sample taken.

Petrolatum comes in barrels. In order to get a representative sample it is best to remove one head, introduce a galvanized iron coil and pass steam until completely liquefied, and then remove the material. The packages can be sampled in the solid form, with an ordinary tryer, but it is then desirable to take samples from both ends, because "toppings" are occasionally practiced.

Waxes and similar products are sampled by cutting numerous small pieces from different portions of the package and making a homogeneous mixture by melting and subsequently cooling. Any dirt will settle to the bottom and can be seen on inspection.

The above notes treat the many-sided subject of sampling only in a limited manner. Many details could be added, but the general principles are set forth, and if others will add of their experience, a fair amount of material will soon be at hand to place the matter on a good basis.

METHOD FOR THE ANALYSIS OF EMULSIONS.

BY L. F. KEBLER AND GEO. W. HOOVER.

An examination of the literature shows that little has been done on the analysis of emulsions, and such results as are recorded are restricted almost exclusively to the determination of the fatty portion. While cod-liver oil and other fatty bodies are considered the essential constituents of emulsions, there is no gainsaying the fact that there are numerous other important medicinal agents which exert a beneficial effect, and harmful agents may at times be present. In arriving at the value of an emulsion these agents must be taken into consideration, and the emulsifying agent may or may not serve the function of a nutritive.

That this portion of analytical chemistry has been so much neglected is surprising in view of the fact that emulsions are so extensively used, not only by physicians, but also by the laity, in many forms of diseases.

The first available results were recorded by H. Leffman and W. Beam,* who reported the per cent. of fat found by them in ten American emulsions. The authors state that the most approved methods in use for fat extraction in milk analysis were employed by them. H. W. Schimpf † estimates the oil by a modification of the well known Adams' method, extracting by means of ether or benzine with a Soxhlet apparatus. Schimpf also used a specially-devised apparatus, whereby the fatty portion is extracted directly from the emulsion by means of the above-named solvents. In our experience these solvents with some emulsions fail to remove all of the fat by this method. In 1899 A. Schneegans ‡ communicated the following method for determining the amount of fats in emulsion: Mix 300 parts of the emulsion with 50 parts each of coarse *sana* and *kaolin*, evaporate to dryness, with occasional stirring, and toward the end of the operation add 50 parts of dry sodium sulphate. The residue thus obtained is powdered, transferred to an extraction apparatus, extracted with ether, the ether evaporated and the residual oil weighed. In the case of emulsions prepared with egg-yolk, simple shaking out with ether may be resorted to after heating the emulsion for a short time at

* Med. News, 1892, *60*, 577.
† Am. Drug., 1894, *25*, 425.
‡ Pharm. Post., 1899, *32*, 692.
§ J. Pharm. Elsass-Loth., 1897, *24*, 321.

100° C. to coagulate the albumin. It must be remembered, however, that egg-yolk contains fat and lecithin, both of which are removed by the above solvent, and will be weighed as fat unless proper provisions are made. Mr. Schneegans places the average amount of these two products in the yolk of the average egg at about 6 Gm. The fat alone of egg-yolk approximates 20 per cent.

This paper deals only with the analytical side, and includes more or less complete identification and determination of inorganic substances, volatile matter, fatty bodies, alcohol, benzoates, salicylates, saccharine, sugar, enzymes and emulsifying agents.

The method employed by us is as follows:

DETERMINATION OF ASH.

This is accomplished by weighing out from 5 to 6 Gm. of emulsion, previously well agitated, in a platinum dish and incinerating in a muffle furnace. The resulting ash, if sufficient in amount, is then examined for the presence of inorganic bodies by the conventional methods. Those most likely to be present in emulsions are compounds of sodium, potassium, iron, calcium, manganese and phosphatic material. The presence of a phosphate might indicate any of the following phosphorus-bearing organic compounds, such as lecithin, phosphates, hypophosphites or glycerophosphates. Whichever may be present in the original compound, must be determined by examination of the aqueous portion of the emulsion. The method for separating the same will be detailed later. The amount and kind of ash may give some indication as to the presence or absence of gum acacia.

ESTIMATION OF TOTAL VOLATILE MATTER.

Into the bottom of an ordinary leaden bottle-cap place a layer of purified and ignited asbestos, and dry to constant weight at 110° C. On to the layer of asbestos place from 5 to 6 Gm. (accurately weighed) of the emulsion, previously well agitated. Transfer the leaden cap and contents to a vacuum apparatus which carries a vacuum of about 550 Mm. (22 inches) at a temperature of approximately 70° C. The drying is continued for 8 to 10 hours, or until constant weight is maintained. This not only gives the amount of moisture, but also includes bodies volatile under the above conditions, including alcohol and certain flavoring agents. The above procedure prevents any material oxidation of the component constituents of the emulsion, which is an important desideratum.

ESTIMATION OF FAT.

After determining the volatile matter as outlined above, the leaden caps and asbestos are cut into pieces of suitable size and transferred to a Knorr extraction apparatus, which consists of a condenser (A), extraction

tube (B), and flask (C). (See accompanying cuts.) In this apparatus the use of stopples and ground-glass joints is entirely dispensed with. There is only one connection, and that is between the condenser and flask, which is sealed by a layer of mercury. The condenser does not need to be described in detail. The extraction tube rests on the neck of the extraction flask, being supported by three projecting glass nipples. Near the bottom it is provided with a perforated platinum disk, which serves the purpose of holding a layer of prepared asbestos. The layer of asbestos is placed into the extraction tube, on top of the perforated platinum disk, in a pulpy, moist condition to the depth of about ¼ inch, by means of a vacuum. The extraction tube and contents are then dried at about 110° C. The material in the extraction tube is then treated with ether of U. S. P. quality from 10 to 14 hours, or until complete extraction is insured. The ether is then completely evaporated at water-bath temperature, and the amount of ether extractive calculated from data in hand. The residue left in the above tubes, after treating with ether, can now be examined to advantage by means of the microscope.

DETECTION OF CERTAIN EMULSIFYING AGENTS.

It is quite possible that the mucilages have been so prepared as to destroy all possible clues to their origin, but in many cases there are frequently left some particles which will indicate their nature. A few starch grains are sufficient to identify gum tragacanth. A few fragments of plant tissue may be sufficient to establish the source from which the emulsifying agent has been obtained. Microchemical tests may also indicate the presence of dextrine and certain mucilaginous bodies. The amount and kind of ash left on incineration also gives evidence as to the presence or absence of acacia.

DETECTION OF ALL BODIES SOLUBLE IN THE AQUEOUS MENSTRUUM EMPLOYED.

It was found by experiment that when emulsions in general are submitted to the process commonly known as "centrifuging" they are separated into two distinct layers, the upper consisting of the fatty and the lower of the aqueous portion. From this the suggestion presented itself, that if we can construct an apparatus which will permit the use of a separatory funnel in place of the ordinary test-tube, it would render the separation of the two layers into which emulsions are converted by centrifuging a very easy matter, and would simplify future analytical operations very materially. An apparatus was accordingly brought into play which exactly fitted the conditions. It consists of an electrical centrifugal, carrying a frame of suitable size, which will hold an ordinary 75 Cc. conical separatory funnel. We have met with only one emulsion, which will be described later, that could not be separated by this means. The process in general from this point is as follows:

Into two separatory funnels of suitable size place about equal amounts of the emulsion. Place both into the centrifuge and whirl a sufficient time to bring about the desired separation, which usually requires from 15 minutes to 1 hour. The aqueous menstruum is then withdrawn and submitted to such testing as may be necessary. In this manner we are able not only to separate emulsions thoroughly so as to simplify analysis, but the fatty portion is left in its original condition, so that it can be extracted by means of the immiscible solvents and identified.

REACTION OF EMULSION.

This can be determined by testing the aqueous layer, obtained in the above operation, by immersing strips of red and blue litmus paper.

DETERMINATION OF ALCOHOL.

Separate a given volume or weight of the emulsion by centrifuging as indicated above, withdraw the aqueous portion and place same in distilling flask. To the fatty residue in the funnel add another portion of water, approximately equal to the amount of material withdrawn, agitate thoroughly, centrifuge, withdraw the clear layer and place it into the distilling flask used above. The latter operation can be repeated a second and a third time, but in practice it has been found that one extraction in addition to the first separation is sufficient to obtain all the alcohol in the emulsion. The aqueous portions contained in the distilling flask are now treated in the usual manner for determining alcohol, namely, render alkaline with sodium carbonate and add a small amount of tannin to prevent frothing. The mixture is then submitted to distillation, and the amount distilled should be exactly equal to the amount of original emulsion employed. By determining the specific gravity of the distillate at the recognized temperature and referring to an alcohol table the per cent. of alcohol can readily be deduced.

DETECTION OF ENZYMES.

Centrifuge any suitable quantity of the emulsion, withdraw the lower aqueous portion and test for the presence of pancreatin and pepsin by the official method of the eighth revision of the Pharmacopœia. It is also advisable to test for the presence of pancreatin by the method of 1890 Pharmacopæia. The methods at present available for detecting and identifying enzymes are far from satisfactory. Many disturbing factors present themselves, but with the scheme in hand the difficulties are no greater than they are in this field exclusive of emulsions. There may be other enzymes added that have the power of converting starch, and thus make it difficult for the analyst to decide whether or not pancreatin is present. It also frequently happens that the aqueous portion of the

emulsion as withdrawn above contains products which will prevent the usual starch-iodine reaction used in determining whether or not the starch has been converted into sugars. The chemicals especially conspicuous are the hypophosphites. It will be necessary for us to extend this line of research, but for the present time it is proper to say that when these disturbing factors are absent and a starch-converting enzyme is present there is little difficulty in ascertaining this fact, and if some of these disturbing elements are present and the starch-iodine reaction is obtained under proper testing, it is evidence that no starch-converting enzyme is present.

DETERMINATION OF SUGARS.

The sugars present may be sucrose, glucose, maltose and lactose. Separate the emulsion as outlined above and determine the sugars in the separated aqueous portion by the methods usually employed for determining sugars. Methods for determining sucrose and glucose will be found in " Bul. Bur. Chem.," 65, pp. 84 and 85 respectively. The most suitable methods available for determining lactose will be found in " Bul. Bur. Chem.," 46, p. 40, and maltose is best determined by method given in Wiley's Principles and Practice of Agricultural Analysis, III., 265.

DETECTION OF SALICYLIC ACID AND SALICYLATES.

Determine the reaction of the aqueous solution prepared by the above centrifugal method from about 50 Cc. of the emulsion. If acid, render slightly alkaline with sodium carbonate. Shake out with ether and discard the ethereal solution. This removes any disturbing oily matter that may be present in the aqueous solution left from the emulsion. Now render this aqueous solution distinctly acid with sulphuric acid and again shake out with ether. The ethereal solution is now evaporated in a porcelain dish, the residue taken up with a small amount of water, and two or three drops of a 0.5 per cent. solution of ferric alum added in such a way that the two solutions come together slowly. If salicylic acid or a salicylate is present, there will be developed a purple or violet color, depending on the amount present.

DETECTION OF BENZOIC ACID AND BENZOATES.

Separate emulsion by centrifugal. Extract aqueous portions as directed under salicylic acid. Confirm the presence of benzoic acid by method outlined in " Bul. Bur. Chem.," 65, 89.

DETECTION OF SACCHARIN.

If, after evaporating the ethereal solution obtained as directed above for detecting salicylic acid and taking up the residue in water, the latter

possesses a distinctly sweet taste, the indication is that saccharin is present. This chemical in the absence of salicylic acid is tested for in the following manner: Separate the aqueous portion of the emulsion by means of the centrifuge, proceed as directed under salicylic acid, evaporate the ethereal solution in a silver dish, take up the residue with 5 Cc. of water, add one Gm. sodium hydroxide, evaporate to dryness and finally heat for 20 minutes at 210° to 215° C. This procedure will convert the saccharin into a salicylate. The fused mass is taken up with water, acidulated with sulphuric acid, and the presence of salicylic acid determined as directed above for detecting this chemical.

In case salicylic acid is present, proceed as directed under salicylic acid until the residue is obtained in the porcelain dish. Dissolve this residue in 10 Cc. of water, add 2 Cc. of 35 per cent. sulphuric acid, bring the mixture to boiling, add drop by drop a 5 per cent. solution of potassium permanganate to slight excess, cool the solution, add about 1 Gm. of sodium hydroxide, and proceed from this point as directed under saccharin in the absence of salicylic acid.

VOLATILE MATTER EXCLUSIVE OF WATER AND ALCOHOL.

The volatile bodies liable to be present are the essential oils and petroleum. The former can usually be identified either by the odor of the emulsion itself or after distillation in connection with the estimation of alcohol.

INORGANIC BODIES.

These can readily be tested for by the conventional methods in the aqueous portion separated by the centrifugal, and details for this purpose are not necessary.

NITROGEN.

Nitrogenous bodies are frequently employed in the preparation of emulsions, and the determination of nitrogen may serve a useful purpose. A considerable percentage of nitrogen will undoubtedly point to the presence of such compounds as casein and egg albumin. The Kjeldahl-Gunning method is best suited for this purpose.

LECITHIN.

This compound is present in emulsions made with egg-yolk, and the best way of determining whether it is present or not is to ash the ether extractive obtained by the method outlined above and test for the presence of phosphates. Under these conditions if a phosphate is present the indications are that lecithin is present.

ANALYTICAL RESULTS.

In order to definitely ascertain whether the scheme originally outlined

would give satisfactory results, a number of emulsions of known composition were prepared according to the directions of the U. S. Pharmacopœia and the National Formulary. The percentage composition of these emulsions was based on weight.

Actual composition of cod-liver oil emulsions prepared according to the eighth revision of the U. S. Pharmacopœia and the National Formulary, with modifications.

Serial Number.	Emulsifying Agent.	Per cent. Moisture.	Per cent. Oil.	Per cent. Solids.
1010	Acacia	37.75	43.71	18.54
1011	Irish Moss	45.47	46.07	8.46
1012	Yolk of Egg	34.38	44.52	21.10
1013	Dextrine	38.49	43.75	17.76
1014	Tinct. Quillajæ	47.18	44.69	8.13
1015	Acacia	49.77	32.63	17.60
1016	Irish Moss	56.16	35.65	8.19
1017	Yolk of Egg	42.17	35.70	22.13
1018	Dextrine	44.53	35.93	19.55
1019	Tinct. Quillajæ	56.03	35.84	8.13
1020	Acacia	48.22	36.22	15.36
1021	Acacia	48.22	36.22	15.36
1022	Acacia	48.60	36.50	14.90
1023	Acacia	36.70	45.04	18.26

The above emulsions vary from the authority cited in the following points:

No. 1013 contains 100 Cc. of simple syrup in place of 125 Cc.

Nos. 1015 to 1019 contain 100 Cc. less per liter of oil than No. 1010.

No. 1023 was prepared according to the directions of the eighth revision of the U. S. Pharmacopœia, and Nos. 1020, 1021 and 1022 were this same emulsion reduced by the addition of definite quantities of water and whisky so as to lower the percentage content of the other constituents.

The above emulsions are representative of those commonly met with in practice. In addition to these a number of the well known emulsions on the market were purchased and submitted to examination, with the following results:

TABLE EMBODYING ANALYTICAL RESULTS OF EMULSIONS.

SERIAL NUMBER.	Reaction to Litmus.	Per cent. of ash.	Per cent. Volatile Matter in 550 Mm. Vacuum at 68–70° C.	Per cent. Ether Extract, Chiefly Fat.	Fat by Saponification Method.	Emulsifying Agent.	Solids. (By Difference.)	Remarks.
1010.....	Acid.	0.356	37.18	42.27	42.5	Acacia.	20.55	
1011.....	Acid.	0.023	43.24	47.89	45.0	Irish moss.	8.87	
1012.....	Acid.	—	31.52	54.87	—	Yolk of egg.	13.61	
1013.....	Acid.	0.027	37.88	44.79	—	Dextrine.	17.33	
1014.....	Acid.	0.020	45.13	45.47	44.0	Tinct. Quillajae.	9.40	Alcohol present.
1015.....	Acid.	0.333	47.11	33.18	32.5	Acacia.	19.71	
1016.....	Acid.	—	54.08	39.06	—	Irish moss.	6.86	
1017.....	Acid.	—	39.37	41.94	—	Yolk of egg.	18.69	
1018.....	Acid.	—	44.66	36.04	33.5	Dextrine.	19.30	
1019.....	Acid.	—	55.59	36.60	—	Tinct. Quillajae.	7.81	Alcohol present.
1020.....	Acid.	0.310	44.99	34.99	34.0	Not known.	20.02	Alcohol 5.68 per cent.
1021.....	Acid.	—	46.89	36.38	—	Not known.	16.73	
1022.....	Acid.	—	44.55	35.63	—	Not known.	19.82	Alcohol 6.71 per cent.
1023.....	Acid.	0.337	37.21	45.19	42.5	Not known.	17.60	
1024.....	Acid.	0.038	45.03	39.22	39.0	Egg.	15.75	Alcohol 8.02 per cent.
1025.....	Acid.	1.750	42.33	43.14	33.0	Not known.	14 53	Phosphatic emulsion.
1026.....	Acid.	2.033	56.07	30.71	32.0	Not known.	13.22	Claims presence of vegetable oils and hypophosphites.
1027.....	Acid.	0.180	45.04	39.30	38.0	Egg.	15.66	
1028.....	Alkaline.	2.240	50.18	38.51	38.0	Not known.	11.31	
1029.....	Acid.	2.660	42.94	24.50	30.0	Not known.	32.56	Petroleum compounds present.
1030.....	Acid.	0.620	30.52	44.41	46.0	Not known.	25.07	
1031	Acid.	0.262	23.65	51.81	40.0	Not known.	24.54	Claims to contain salts of calcium and manganese.
1032.....	Neutral.	0.068	53.26	39.12	33.0	Not known.	7.62	
950.....	Acid.	0.325	55.33	30.00	—	Not known.	14.34	No saponifying enzyme present.
952.....	Acid.	0.210	58.03	38.67	38.5	Not known.	2.51	Salicylic acid present but no pancreatin.

An examination of the above tables shows that the method outlined above for extracting the fatty portion with ether is satisfactory, excepting in the case of the egg emulsions. There seems to be a disturbing factor somewhere which has not been located at present. It was at first thought that the discrepancy was traceable to the presence of glycerine in the glyconin, but an examination along this line indicates that this is correct only to a small degree. A sample of glyconin was treated as directed for the estimation of fats in the method described above, and the ether removed only 14.54 per cent. While this indicates that something has been removed from the glyconin aside from fat, the total percentage is not sufficient to account for the discrepancies present in several of the egg emulsions.

The method employed for the determination of volatile matter is not applicable to emulsion 1029, which is a petroleum product. The high percentage of volatile matter is undoubtedly due to the volatilization of the petroleum products of the emulsion. This is emphasized by the fact that when the amount of fat is determined by the saponification method, the percentage of fat indicated to be present is materially in excess of that removed by the ether.

Aside from the egg emulsion and the petroleum emulsion, the various figures obtained on analysis correspond closely with those which represent the amount of material known to be present. There are a number of cases where the differences amount to 2 per cent., but this we believe is largely due to errors of manipulation, because we find that it is very important to exercise care in securing an average sample by thorough agitation previous to weighing off, and it was found by practice to be best to place approximately the desired quantity in a weighing flask and agitate same thoroughly before a sample is taken, and this precaution is to be again observed when a duplicate is taken from the same bottle.

With a single exception, all of the emulsions examined are either acid or neutral. One is distinctly alkaline, requiring 0.9 Gm. of pure sulphuric acid to neutralize the alkalinity of 100 Cc. This is a very unusual emulsion, as will be seen later on.

The amount, physical appearance and composition of the ash are all useful aids in arriving at the probable medicinal chemicals employed, and in the absence of these the nature of the emulsifying agent may be indicated. As will be seen, the per cent. of ash in the emulsions prepared with Irish moss, dextrine and quillaja is very low. Acacia emulsions run a little higher in ash. Very little weight can be attached to these ash determinations when inorganic chemicals are present in the emulsions.

The amount of volatile matter obtained is closely in accord with the amount that is known to be present. In the case of a petroleum emulsion purchased on the market, the figures show that the usual method

employed for determining moisture will not apply. This can be readily seen by a glance at the table. The ether extracted 24.5 per cent., whereas the amount of fat found to be present by the saponification method amounted to 30 per cent. The difference between these two figures may undoubtedly be attributed to the loss of certain volatile petroleum products during the process of drying.

When it was observed that the ether extracted a larger amount of material than was known to be present in the emulsion that could be extracted with ether, it was deemed desirable to determine the actual amount of fat by other methods. The method at present largely used for the determination of fatty products is the well known Babcock test. It was found, however, that this method could only be utilized after some experimentation with the emulsions in hand, that is, no set procedure could be outlined by means of which the Babcock method could be applied to all emulsions. If the details were worked out for an acacia emulsion, the same amounts of the various reagents could not be used for an egg or a dextrine emulsion. It was readily seen from this that the Babcock method would not be applicable in practice, because the nature of the emulsifying agents and other ingredients is generally not known. After some experimentation it was found that the fat in all emulsions could readily be determined by the saponification method and the use of the centrifuge. The process as used for obtaining the results recorded in the paper is as follows:

Into a Babcock cream-test bottle place 9 Gm. of the emulsion to be examined. Add 10 Cc. of a saturated aqueous solution of potassium hydroxide. Heat on the steam-bath for about 15 minutes and add cautiously, drop by drop, 15 Cc. of 75 per cent. sulphuric acid. This will neutralize the excess of alkali and liberate the fat which is now to be brought to the surface by centrifuging for 5 minutes. Then add enough hot water to bring the top of the contents of the bottle up to the neck, and centrifuge again for 2 minutes. After the second centrifuging, add sufficient hot water to raise the fat to within about ½ inch of the top of the flask, centrifuge again for 1 minute, remove the bottle and read off the per cent. of fat as indicated by the scale on the neck of the bottle. The readings were made at about 75° C. This scale is made for use with 18 Gm. of material, and inasmuch as only 9 Gm. were used in the above operation, it will be necessary to multiply the percentage indicated by the scale by two.

On comparing the results obtained by the ether-extraction method and the saponification method, it will be found that they run closely parallel, excepting in those cases where it has been found that a disturbing factor exists. This is particularly shown in the case of emulsion No. 1029, and was known to exist in the case of egg emulsions, but this fact we were not

able to show because of the loss of the egg emulsions before this method could be applied. The saponification method also reveals the fact that there is something present in emulsions Nos. 1025, 1031 and 1032 which vitiates the ether extractive. Exactly what the difficulty is has not been made out.

The solids being taken by difference, naturally show any inequality that might be present in any part of the analytical work. In those emulsions, however, where the exact amount of solid material present was known, the amount obtained by difference is very well in accord with that actually present.

Before concluding, it is necessary to say that in the case of only one emulsion was the method as outlined above impracticable, and that was No. 1028. After working with it unsuccessfully for a considerable length of time, Mr. Schulz, of this laboratory, noticed that the label on the bottle containing this emulsion directed an unusual amount of caution to prevent the emulsion from freezing, which would destroy it, and from this observation he hit upon the idea that by freezing the emulsion it might be possible to separate it into two layers, as had been the case with other emulsions. After a trial experiment he found that such a procedure would bring about the desired results. In order to separate this emulsion, it is therefore necessary to first freeze it, then warm to about 60° C., and centrifuge as directed with the other emulsions.

Mr. Schulz did all of the work connected with the Babcock method, and made all of the fat determinations by the saponification method recorded in this paper.

ANALYSIS OF THE MEXICAN PLANT TECOMA MOLLIS, H. B. K.

BY L. F. KEBLER AND A. SEIDELL.

The plant material used for the following analysis was submitted to the U. S. Department of Agriculture by Mr. Carl Lumholtz, with the information that the inhabitants of certain parts of Mexico use it to a considerable extent in the treatment of disease, and it was thought that an examination might reveal the presence of some valuable medicinal constituents which would warrant the suggestion that the plant be introduced into some of the Southern States for cultivation.

The common name, if any, by which the plant is known locally has not been secured. On submitting a specimen of the plant consisting of flower, fruit, stems and leaves to the U. S. National Museum it was identified as *Tecoma mollis*, H. B. K., family *Bignoniaceæ*. The specimen is now in the herbarium of the U. S. National Museum, where there are several others of this same plant. According to "Biologia Centrali-Americana," 1882, *2*, 496, by Hemsley, this plant is also found in Colombia, Peru and Chili of South America, and is known by the following syno-

nyms: *Tecoma sorbifolia, H. B. K.; Tecoma stans y velutina, DC.; Stenolobium molle*, and *Bignonia tecomoides, DC.* A careful examination of the literature dealing with medicinal plants failed to reveal any recorded investigation of this plant under any of the names enumerated above. It is possible, however, that some observations may have been reported under a local or common name, which on this account have been overlooked.

For this analysis the leaves only were used, being reduced to a number 40 powder. The odor was slightly aromatic and the taste a mild persistent bitter, suggesting a number of plants containing the so-called "bitter principles." A preliminary examination indicated the absence of alkaloids or any other readily-recognizable body commonly present in medicinal plants. It was thought, however, that a more careful analysis following the schemes of Dragendorff and of Parsons might disclose the constituent of the plant in which resided the useful qualities that it was supposed to possess. Analyses were therefore made simultaneously by these two methods. Twenty Gm. of the air-dried material were extracted in all cases with approximately ten times the amount of solvent. The moisture was determined at 110° C., and amounted to 6.73 per cent. The ash, taken in a muffle furnace, amounted to 5.74 per cent., and was alkaline to litmus paper. The water-soluble portion amounted to 49.33 per cent., and contained chlorides, sulphates, phosphates, salts of calcium, magnesium, potassium and sodium. Water acidulated with hydrochloric acid dissolved 46.15 per cent. of the ash, and contained salts of iron, aluminum, magnesium, calcium and phosphates. The nitrogen, estimated by the Kjeldahl-Gunning method, amounted to 2.07 per cent.

The results of the analysis by the method of Dragendorff (slightly modified) are as follows:

Moisture		6.73 per cent.
Petroleum Ether Extract		1.65 per cent.
Consisting of an acid, oily residue, which required 3.0 Cc. $\frac{N}{10}$ alkali to neutralize the acid and 4.5 Cc. $\frac{N}{10}$ alkali to saponify the fats, after separating the acid portion.		
Ether Extract—		
Portion soluble in water (probably an acid resin)	1.33 per cent.	
Portion insoluble in water, but soluble in alcohol (consisting of chlorophyll and resin)	2.96 per cent.	
		4.29 per cent.
Absolute Alcohol Extract—		
Portion soluble in water:		
Tannin, extractive, etc.	7.26 per cent.	
Sugar, etc.	0.34 per cent.	
	7.60 per cent.	
Portion insoluble in water (acid resin)	0.86 per cent.	
		8.46 per cent.

Water Extract—		
Total acidity required 34.4 Cc. $\frac{N}{10}$ KOH (phenolphthalein).		
Inorganic bodies	2.83 per cent.	
Mucilaginous substance	1.26 per cent.	
Glucoses, acids and extractives	13.81 per cent.	
		17.90 per cent.
Dilute Alkali Extract (*cold*)—		
Mucilaginous substance	3.32 per cent.	
Probably albuminoids	0.87 per cent.	
		4.19 per cent.
Dilute Acid Extract (*cold*)—		
Organic and inorganic material		8.48 per cent.
Fiber, Cellulose, etc.		48.64 per cent.
		100.34 per cent.
Ash		5.74 per cent.
Nitrogen		2.07 per cent.

The petroleum-ether extraction was accomplished in a Soxhlet apparatus, and was continued daily for about five days in order to obtain uncolored petroleum-ether in contact with the sample. The petroleum-ether extract left, on evaporation, a pale yellow residue, which yielded an acid solution when dissolved in alcohol. This solution, after being titrated with standard potassium hydroxide, was filtered, and the insoluble portion transferred to a flask and saponified by boiling about three hours with standard alkali, using a reflux condenser.

The plant material remaining in the Soxhlet apparatus was allowed to dry, and about 200 Cc. of ethylic ether placed in the flask of the apparatus. The ethereal extract was colored green, and about ten days were required for complete extraction. On treating the residue obtained from the ethereal extract by evaporation, with water, the aqueous solution was acid to phenolphthalein, and contained a resin which was found to be soluble in alcohol, partially soluble in ether, and which reduced Fehling's solution. This residue was carefully tested for all the substances enumerated by Dragendorff as likely to appear at this point, but no indication of anything other than resin was obtained. On account of its small amount (0.2675 Gm. = 1.33 per cent.) its physiological action was not tested. That portion of the residue of the ethereal extract not soluble in water was tested physiologically by mixing about one-half Gm. of the material with meat and feeding to a cat. The cat experienced no noticeable inconvenience from this large dose, and it is to be concluded that the medicinal virtues of the plant do not reside in this water-insoluble ether extract.

The alcoholic extraction of the plant material was effected in a stoppered Erlenmeyer flask, using 200 Cc. of absolute alcohol and the sample remaining after the ether extraction. The flask was shaken by hand at

intervals during five weeks, after which time the solution was filtered through a dry filter and the plant material washed sufficiently with absolute alcohol to remove the total alcohol-extracted portion. The washings were received in a separate vessel. The tannin was determined by treating the residue obtained from an aliquot portion of the alcoholic extract with water and adding lead subacetate to the filtered aqueous solution. The precipitate obtained was washed, dried and weighed, after which the organic material was incinerated and the lead remaining weighed, the loss being stated as tannin and extractives. The water-insoluble portion of the residue obtained from the alcoholic extract was a black, amorphous mass corresponding to 0.86 per cent. of the plant. This residue was completely soluble in dilute ammonia, and appeared to be a portion of the same resin which the ether had failed to remove in the previous extraction of the plant. Although the material extracted by alcohol appeared to be principally tannin, it was thought desirable to test its action on a cat. The dose administered, however, as was to be expected, produced no evident unusual physiological action.

The water extract of the sample was made in the same flask which had been used for the alcoholic extraction. Two hundred Cc. of water and the dried plant material remaining after the alcoholic extraction were used. At the end of 24 hours the aqueous solution was filtered through a dry filter, the plant material washed several times with water and the washings discarded. An aliquot portion of the filtrate was titrated with standard alkali. The total extracted material and ash were determined in another portion of the filtrate. The mucilaginous material was precipitated from a fresh portion of the aqueous solution. The filtrate from the mucilaginous material strongly reduced Fehling's solution, indicating, therefore, according to Dragendorff, the presence of glucoses, acids and extractives. A portion of the residue obtained by evaporation of the aqueous extract to dryness was also given to the cat. This likewise produced no evident ill effects.

The dilute alkali and dilute acid extracts were obtained by successively extracting the plant material with 200 Cc. of the cold menstruum in each case. After the dilute acid extraction the material remaining was dried and weighed.

From the results of the physiological tests stated in the previous paragraphs it may be concluded that *Tecoma mollis* contains at least no very powerfully-acting constituents, and it also appears probable that the plant contains no ingredient of exceptional medicinal virtue.

The results obtained by the analysis made according to Parsons' method, modified as stated below, are as follows:

Moisture ..... 6.73 per cent.

Benzole Extract—			
Soluble in water		0.19 per cent.	
Soluble in dilute acid		0.06 per cent.	
Soluble in 80 per cent. alcohol:			
Chlorophyl	1.17 per cent.		
Resins	1.98 per cent.		
		3.15 per cent.	
Insoluble in 80 per cent. alcohol:			
Wax, fats, fixed oils		1.41 per cent.	
			4.81 per cent.
Alcoholic Extract (with approximately 90 per cent. alcohol)—			
(A) Soluble in absolute alcohol.			
(a) Soluble in water:			
Tannin, etc. (precipitated by lead subacetate)	4.41 per cent.		
Extractives, etc.	6.36 per cent.		
		10.77 per cent.	
(b) Insoluble in water:			
b′ Soluble in dilute HCl.	0.53 per cent.		
b″ Soluble in dilute NH_4OH, acid resin.	8.58 per cent.		
		9.11 per cent.	
(B) Insoluble in absolute alcohol:			
(c) Soluble in water, tannin and extractives		7.97 per cent.	
(d) Insoluble in water, resin extractives		1.41 per cent.	
			29.26 per cent
Cold Water Extract—			
Organic part (gum)		3.16 per cent.	
Inorganic part (SO_4, Ca, Fe, PO_4, etc.)		1.56 per cent.	
			4.72 per cent.
Acid Extract (hot)—			
Starch and isomers		14.98 per cent.	
Acid extractive (not starch)		9.63 per cent.	
			24.61 per cent.
Alkali Extract (hot)			21.49 per cent.
Cellulose			10.71 per cent.
			102.33 per cent.

The benzole extraction of the 20-Gm. sample of the ground *Tecoma mollis* leaves was made in a continuous extraction apparatus, which allowed the condensed vapors to percolate through a layer of the plant material about three inches thick. About 200 Cc. of benzole were used, and the extraction continued four days. On evaporating the benzole an almost black residue was obtained. The portion of this residue recorded as soluble in water and in dilute acid was amorphous, and gave no indications of alkaloids or glucosides. It resembled very much the resin found in the alcohol-soluble portion of this residue.

The statements given in the usual outlines of the Parsons' method found in text-books are not clear as to just how the alcoholic extraction of the

plant should be accomplished. It is not certain whether the required 12 to 14 hours' continuous extraction as stated is to be performed in the cold by percolation or in a closed flask, using a definite ratio of plant material to solvent, or by some other convenient method. In the present case it was decided to use the same continuous extraction apparatus as employed for the benzole extraction, placing 80 per cent. alcohol in the flask of the apparatus. It was of course recognized that by this plan the extraction would actually be made with alcohol of a concentration higher than 80 per cent. In order to determine approximately just what strength of alcohol this would be, a blank experiment was made, using 83 per cent. alcohol in the flask and a test-tube in a position occupied by the sample. In this way it was found that the condensed alcohol collected in the test-tube had a specific gravity of 0.8226, and thus corresponded to 91 per cent. alcohol. Therefore in the present case, by using 80 per cent. alcohol, in the flask the plant was actually extracted with approximately 90 per cent. alcohol.

The examination of the residue obtained by evaporating the alcoholic extract was made by treating this residue with absolute alcohol, thus separating it into two portions, each of which was further separated by treatment with water into a soluble and an insoluble portion. In the present case this procedure proved rather unsatisfactory, since the absolute alcohol separation yielded two portions which appeared almost identical in all respects except their solubility in absolute alcohol. The time required, therefore, to make the separation was almost doubled, without a corresponding improvement in the results.

A comparison of the figures obtained by the two methods of analysis shows that the quantity of material extracted by benzole in the Parsons' method corresponds in a measure to the amount removed by both the petroleum ether and ethylic ether extractions in the Dragendorff method. In the latter case, however, the two solvents give a separation which is clearly advantageous from an analytical standpoint.

It will be observed that the alcoholic extract of the Parsons' method yields a result which agrees fairly well with the absolute alcohol and water extract together of the Dragendorff method. Here again the use of the two solvents has resulted advantageously, in that a very clear separation of the tannin, on the one hand, and the glucoses, extractives, etc., on the other, has been effected.

With regard to the remaining steps of the two analyses, the conditions vary materially in the two cases, and the wide differences obtained are naturally to be expected.

CONCLUSION.

The results of the analytical work described in the preceding pages

show that *Tecoma mollis* contains no alkaloid or other well-characterized medicinally important plant constituent. It is probable, however, that the virtues attributed to it may be associated in some way with the persistent bitter taste which the plant is found to possess. The bitter ingredient appears principally in the alcoholic and aqueous extracts. Plants such as gentian, taraxacum, quassia, etc., possessing a similar bitter taste are recognized as having a stimulating and tonic effect on the human system, and it is probable that the physiological action of *Tecoma mollis* may be of a similar character.

In regard to the advantages possessed by the two methods of analysis, it appears that in the present case at least the Dragendorff method is to be preferred. With this method the solvents employed effect a better separation of the constituents than do those used in the Parsons' method.

THE DESIRABILITY OF USING UNIFORM AND DISTINCT ABBREVIATIONS FOR PERIODICALS, WITH A SUGGESTED LIST.

BY L. F. KEBLER.

The desirability of using concise, clear and definite references in literature becomes apparent to any one who gives the subject only superficial thought, while those who have spent hours in search of communications, because of vague references, know how time-saving and welcome such a system would be. Particularly is this true of the pharmaceutical profession because of its cognate nature and the vast field covered. A few examples of reference found in the last volume of the Proceedings of this Association, quoted from and used by periodicals, will show how vague and useless some of them are: "Pharm. Centralh.," "Brit. and Col. Druggist," "Medical Gleaner," "Journal of Botany," "through Jour. Soc. Chem. Ind.," "from Bull. de Sciences Pharm.," "Boll. Chim. Farm." It may be contended by some abstractors that these references approximate the date of the journal in which the abstract is published. Even if this were true the fact remains that such references are indefinite and time-consuming when a reader wishes to verify the original article, but it is well known that some of these abstracts appear from one to three years after the original communication has been made public.

Some of our publications have had the misfortune of beginning a new "Series" with almost every editor and the result is that some of them are in their 5th or 6th series. For example, the Chemisches Central-Blatt is in its 5th series and the Journal de Pharmacie et de Chimie is now in its 6th series. Frequently we meet with references to the latter periodical, like the following: "Journ. Pharm. Chem., *6*, 12." Ordinarily such a reference is considered quite satisfactory, but when put into practice it will be found to present many difficulties. With six series there are six books marked volume 6 and unless the reader can get some clue as to date it will be necessary to call for and possibly necessary to consult the entire

number before the information sought for is found, but it occasionally happens that neither the reader nor the attendant in the library know that there are six distinct volumes of the same number. The usual result is that the attendant supplies the first number-six volume met with and the consultant fails to find what he is looking for and is led to the belief that the reference is either incorrect or the article in question was never published. The writer had a number of these experiences before he became acquainted with the situation. It may mean the failure of certain undertakings. The proper way of giving such references will be detailed shortly.

Other abstractors are excessively redundant. The following is an instance: "Pharm. Centralh., *45*, Nos. 20–25 (May 19 and 26, and June 2, 9, 16 and 23, 1904), 371, 389, 409, 433, 451 and 469." Here is an unusual and unnecessary amount of repetition. The following form gives all that is necessary: Pharm. Centralh., 1904, *45*, 371, 389, 409, 433, 451 and 469. This gives the name of the journal, the year, volume and pages, there being neither series nor parts in this publication.

In giving full, clear references the following data cover all the essentials and must be included so far as may be necessary: Name of publication, date of publishing same, series, edition or revision, volume, part and page. The following examples will serve as illustrations:

Name.	Year.	Series.	Volume.	Part.	Page.
Chem. Centrbl.	1903	(5)	7	2	456
Name.	Year.		Volume.		Page.
Am. J. Pharm.....	1905		77		168
Name.	Year.		Revision.		Page.
U. S. Pharm.....	1905		8		345

The subject of our working literature, our tools if you please, is woefully neglected by the universities and colleges. One of the writer's most valuable assets of college life, was a fairly comprehensive knowledge of the sets of chemical and pharmaceutical periodicals, gained during a study of the evolution of the methods used for detecting and estimating nitrogen. In conclusion the hope is expressed that the Scientific Section will place itself on record as favoring some action which will bring order out of chaos.

The abbreviations submitted are prepared as far as possible in accordance with the following principles.

1. Follow the exact order of words of the title.
2. Make them as brief as is consistent with clearness to those who are familiar with pharmaceutical literature.
3. Follow the orthographical usages of each language.
4. Maintain uniformity.

ABBREVIATIONS FOR PERIODICALS.

Alumni Report, Philadelphia College of Pharmacy .....Alumni Rep. Phila. Col. Pharm.
American Chemical Journal.....Am. Chem. J.

American Druggist ..... Am. Drug.
American Journal of Pharmacy ..... Am. J. Pharm.
American Journal of Science ..... Am. J. Sci.
American Medicine ..... Am. Med.
Analyst ..... Analyst.
Annalen (Liebig's) ..... Ann. (Liebig).
Annalen der Physik, Poggendorff. ..... Ann. Physik.
Annales de chimie ..... Ann. chim.
Annales de chimie analytique ..... Ann. chim. anal.
Annales de chimie et de physique ..... Ann. chim. phys.
Apothecary ..... Apoth.
Apotheker-Zeitung ..... Apoth. Ztg.
Archiv der Pharmacie ..... Arch. Pharm.
Archiv für Experimentelle Pathologie und Pharmakologie ..... Arch. Exp. Path. Pharmakol.
Berichte der deutschen chemischen Gesellschaft ..... Ber. d. chem. Ges.
Berichte der deutschen pharmaceutischen Gesellschaft .. Ber. d. pharm. Ges.
Berliner klinische Wochenschrift ..... Berlin. klin. Wochsh.
Botanical Gazette ..... Bot. Gaz.
Botanical Magazine (Curtis's) ..... Bot. Mag.
Botanische Zeitung ..... Bot. Ztg.
Botanischer Jahresbericht ..... Bot. Jahresber.
Botanisches Centralblatt ..... Bot. Centrbl.
Botaniska Notiser ..... Bot. Notiser.
British Pharmacopœia ..... Brit. Pharm.
British and Colonial Druggist ..... Brit. Col. Drug.
British Medical Journal ..... Brit. Med. J.
Bullettino di chimica e farmacia ..... Bul. chim. farm.
Bulletin de l'Association belge des chimistes ..... Bul. Assoc. belge chim.
Bulletin de l'Association des chimistes de sucererie et de distillerie ..... Bul. Assoc. chim. sucr.
Bulletin de la societe chemique de Paris ..... Bul. soc. chim.
Bulletin of Pharmacy ..... Bul. Pharm.
Bulletin of (State) Agricultural Experiment Station .... Bul. ——. Exp. Sta.
Bulletin of the Bureau of Chemistry ..... Bul. Bur. Chem.
Chemical Gazette ..... Chem. Gaz.
Canadian Pharmaceutical Journal ..... Can. Pharm. J.
Chemical News ..... Chem. News.
Chemiker Zeitung ..... Chem. Ztg.
Chemist and Druggist ..... Chem. & Drug.
Chemische Industrie ..... Chem. Ind.
Chemische Zeitschrift ..... Chem. Zts.
Chemische Revue über die Fett-und-Harz Industrie .... Chem. Rev. Fett. Harz. Ind.
Chemisches Central-Blatt ..... Chem. Centrbl.
Comptes rendus hebdomadaires des séances de l'Académie des sciences ..... Compt. rend.
Deutsche Zucker-Industrie ..... Deutsche Zucker-Ind.
Dingler's Polytechnisches Journal ..... Dingler's Polytech. J.
Druggist's Circular ..... Drug. Cir.
Drugs, Oils and Paints ..... Drugs, Oils and Paints.
Electrochemical Journal ..... Electrochem. J.
Experiment Station Record ..... Exp. Sta. Rec.

French Codex ..... Fr. Codex.
Gazetta chimica italiana ..... Gaz. chim. ital.
German Pharmacopœia ..... Ger. Pharm.
Italian Pharmacopœia ..... Ital. Pharm.
Jahrbuch der Erfindungen und Fortschritte auf den Gebieten der Physik und Chemie ..... Jahrb. Phys. Chem.
Jahresbericht uber die Fortschritte der Chemie ..... Jahresber. Chem.
Jahresbericht uber die Fortschritte der chemischen Technologie ..... Jahresber. chem. Tech.
Journal de pharmacie (d'Anvers) ..... J. pharm.
Journal de pharmacie et de chimie ..... J. pharm. chim.
Journal des fabricants de sucre ..... J. fab. sucre.
Journal für Landwirthschaft ..... J. Landw.
Journal für praktische Chemie ..... J. prakt. Chem.
Journal of Analytical Chemistry ..... J. Anal. Chem.
Journal of Physical Chemistry ..... J. Phys. Chem.
Journal of the American Chemical Society ..... J. Am. Chem. Soc.
Journal of the American Medical Association ..... J. Am. Med. Assoc.
Journal of the Chemical Society ..... J. Chem. Soc.
Journal of the Federated Institutes of Brewing ..... J. Fed. Inst. Brewing.
Journal of the Franklin Institute ..... J. Frank. Inst.
Journal of the Royal Agricultural Society ..... J. Roy. Agr. Soc.
Journal of the Royal Microscopical Society ..... J. Roy. Micros. Soc.
Journal of the Society of Chemical Industry ..... J. Soc. Chem. Ind.
Landwirthschaftlichen Versuchs-Stationen ..... Landw. Versuchs. Stat.
L'Union pharmaceutique ..... L'Un. pharm.
Monatshefte fur Chemie und verwandte Theile anderer Wissenschaften ..... Monatsh. Chem.
Medical Record ..... Med. Rec.
Merck's Archives ..... Merck's Arch.
Merck's Berichte ..... Merck's Ber.
Merck's Bulletin ..... Merck's Bul.
Merck's Report ..... Merck's Rep.
Meyer Brothers' Druggist ..... Meyer Bro. Drug.
Midland Druggist ..... Midland Drug.
Moniteur Scientifique ..... Moniteur Sci.
National Druggist ..... Natl. Drug.
New Idea ..... New Idea.
Oesterreichische Chemiker Zeitung ..... Osterr. Chem. Ztg.
Oil, Paint and Drug Reporter ..... Oil, Paint, Drug Rep.
Patent Office Gazette ..... Pat. Of. Gaz.
Pharmaceutical Archives ..... Pharm. Arch.
Pharmaceutical Era ..... Pharm. Era.
Pharmaceutical Journal ..... Pharm. J.
Pharmaceutical Review ..... Pharm. Rev.
Pharmaceutische Centralhalle fur Deutschland ..... Pharm. Centralh.
Pharmaceutische Zeitung ..... Pharm. Ztg.
Pharmaceutische Berichte ..... Pharm. Ber.
Pharmaceutische Post ..... Pharm. Post.
Pharmazeutische Praxis ..... Pharm. Prax.
Pharmaceutische Weekblad ..... Pharm. Weekblad.
Philosophical Magazine ..... Phil. Mag.

Philosopical Transactions of the Royal Society (London). Phil. Trans.
Proceedings of the (State) Pharmaceutical Association . Proc. ——. Pharm. Assoc.
Proceedings of the American Academy of Sciences ..... Proc. Am. Acad. Sci.
Proceedings of the American Association for the Advancement of Science ..... Proc. Am. Assoc. Adv. Sci.
Proceedings of the American Pharmaceutical Association. Proc. Am. Pharm. Assoc.
Proceedings of the British Pharmaceutical Association .. Proc. Brit. Pharm. Assoc.
Proceedings of the Chemical Society (London) ..... Proc. Chem. Soc.
Proceedings of the Philosophical Society of Philadelphia. Proc. Phil. Soc. Phila.
Proceedings of the Royal Philosophical Society of London. Proc. Roy. Phil. Soc.
Proceedings of the Royal Society of London ..... Proc. Roy. Soc.
Recueil des travaux chimiques de Pays-Bas .... Rec. trav. chim.
Repertoire de pharmacie ..... Rep. pharm.
Revue internationale des falsifications ..... Rev. intern. falsif.
Schimmel's Report ..... Schimmel's Rep.
Schweizerische Wochenschrift fur Chemie und Pharmacie. Schweiz. Wochens. Chem. Pharm.
Science ..... Science.
Scientific American ..... Sci. Am.
Spatula ..... Spatula.
Sucrerie indigène et coloniale ..... Sucr. indigène.
Transactions of the American Electrochemical Society .. Trans. Am. Elec. Chem. Soc
Therapeutische Monatshefte ..... Therap. Monatsh.
Therapeutic Gazette ..... Therap. Gaz.
Union pharmaceutique ..... See L'Un. pharm.
United States Pharmacopœia ..... U. S. Pharm.
Zeitschrift für analytische Chemie ..... Zts. anal. Chem.
Zeitschrift für angewandte Chemie ..... Zts. angew. Chem.
Zeitschrift für angewandte Mikroscopie ..... Zts. angew. Mikros.
Zeitschrift für anorganische Chemie ..... Zts. anorg. Chem.
Zeitschrift für Biologie ..... Zts. Biol.
Zeitschrift für Elektrochemie ..... Zts. Elektrochem.
Zeitschrift für Farben-und-Textil Chemie ..... Zts. Farb.-Text. Chem.
Zeitschrift für Instrumentenkunde ..... Zts. Instrumentenkunde.
Zeitschrift für öffentliche Chemie ..... Zts. öffentl. Chem.
Zeitschrift für physikalische Chemie ..... Zts. physikal. Chem.
Zeitschrift für physiologische Chemie ..... Zts. physiol. Chem.
Zeitschrift für Untersuchung der Nahrungs-und-Genussmittel ..... Zts. Nahr. Genusm.

Some of the above abbreviations are longer than those frequently employed in pharmaceutical literature, for example, *U. S. Pharm.* is preferred to *U. S. P.* because the designation *U. S. P.*, while it is a very well-known expression to the pharmaceutical profession, it is not to librarians, and it must be remembered that these abbreviations are to be used not only for the convenience of the pharmaceutical profession but also by librarians. It is customary to abbreviate the title of a well known French periodical by *Compt. rend.* The librarian of the Department of Agriculture, to whom the above list was submitted, contended that this is too brief and suggested that this matter be discussed, the librarian being of the opinion that the following abbreviation would be much better, namely, *Compt. rend. Acad. Sci. Paris.*

The above list does not include all periodicals in which information of a pharmaceutical nature may be found but only such as are commonly used. With the above principles in view suitable abbreviations can readily be made for any periodical or publication.

The Chair expressed regret that it had not been possible to carry out the promise made in his circular letter that all papers prepared for the Section should receive consideration, but the time taken up by the discuscussion of the Pharmacopœia and the premature ending of the first session had cut the time short. He expressed the hope that next year a third session would be provided for the Scientific Section.

Mr. Kremers heartily concurred in this view, and moved that it be declared the sense of the Section that the Council be requested to provide simultaneous sessions hereafter, in order that justice might be done the programme.

Mr. Kebler said he could appreciate this suggestion, as he had written six papers for this Section, and had only had the opportunity to present one, the other five being read by title. He said it had taken him five days to write these papers, and he thought he ought to have at least one minute to present them.

Secretary Caspari said the time was undoubtedly coming when simultaneous sessions would have to be provided. The question was, how it was to be arranged.

Mr. Charles E. Caspari suggested the advisability of incorporating in the motion that the Scientific Section be given a third session, to be held at the same time as the Section on Commercial Interests, but Secretary Caspari said the matter would be taken care of in the programme.

Mr. C. E. Caspari thereupon moved that the Council be requested to provide a third session for the Scientific Section in any way it saw fit.

Mr. Kremers seconded this motion, and the Chair put the motion to so provide at the next meeting, and it carried.

The Chair announced that the next order of business was the installation of officers for the ensuing year, but that in view of the late hour, it was hardly necessary to go through the usual formalities, and he would simply introduce Mr. Charles E. Caspari, of St. Louis, as his successor in the office as Chairman.

Mr. Caspari said he believed it was customary for the incoming Chairman to indulge in a little "hot air," but that would be dispensed with on this occasion, and he would only remark that his predecessors in office had set a very high mark, and he would be satisfied if he could live up to it.

Mr. Caspari then took the chair and introduced Mr. Daniel Base, of Baltimore, as the new Secretary of the Section. Mr. Base said speaking was out of his line; he would sooner act.

Mr. Caspari announced that he and Mr. Base had selected H. V. Arny, of Cleveland, as their associate on the committee.

New business was called for, but none was offered.

The reading of the minutes was dispensed with, and on motion of Mr. Gane the Section stood adjourned *sine die*.

MINUTES

OF THE

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

FIRST SESSION—THURSDAY EVENING, SEPTEMBER 7, 1905.

The first session of the Section on Practical Pharmacy and Dispensing was called to order at 8:10 p. m. by Chairman Charles A. Rapelye, of Hartford, Conn.

The Chair called attention to the absence of the Secretary, Mr. W. C. Kirschgessner, of Detroit, and suggested the election of somebody in his place. Mr. Wilbert thereupon nominated Mr. H. A. B. Dunning, of Baltimore, for this position, Mr. Alpers seconded the nomination, and Mr. Dunning was duly elected and assumed the duties of the office.

Mr. Alpers was then called to the chair while Mr. Rapelye presented the following address:

Fellow Members: We meet here to measure man with man our experiences and successes in the field of practical pharmacy. In seeking new light on some trying problems we turn to our brother pharmacists for assistance in solving the difficulty. None are so wise that something may not be learned from another, and by the exchange of ideas many are the gainers.

In scarce any field of human activity is the responsibility greater, or the necessity for eternal vigilance more real than in pharmacy. Practical pharmacy has its enthusiasts and its delvers, ever vigilant, active and alert to gain any new light, ever seeking to improve old methods and instituting new ones; men of ideas not content to plod, but ever seeking the ideal; although the ideal may be difficult of attainment we can at least still direct our efforts toward ultimate success. While the complex conditions of modern pharmacy may to an extent make the task seem almost hopeless, and commercialized pharmacy has placed us in a position created by modern conditions and not altogether of our own making, we are still hopeful and vigilant. In the race for success we are compelled by competition to deviate from the strict line of professional pharmacy, and to introduce commercial features that are neither of assistance or in keeping with our desire to conduct a true pharmacy; but commercial conditions must be given attention and we yield to the demand.

It is not my purpose to discuss the influence of commercial conditions any further than may be necessary in treating the subject of modern methods and their effect on practical pharmacy and dispensing.

Is so-called practical pharmacy as practical in the hands of the pharmacist as it should be? We have the Pharmacopœia and it must be followed in preparing standard galenicals and cannot be deviated from in the matter of strength or purity. We also have the National Formulary and Dispensatories which serve as guides, but lack the authority of the Pharmacopœia.

Practical pharmacy contemplates originality in its votaries, who should never be content to remain idle or allow to go undeveloped any idea that will add to the knowledge possessed by the workers in the field of medicine. Having been taught from the time of our entrance into the field of pharmacy to depend on these works, is it not true that we have become so accustomed to their acceptance in the matter of strength and methods of procedure, that we are far too content to rest there and not become what we should be, original investigators. Follow the Pharmacopœia we must, but that need not deter us from improving on methods already in use, or in devising new ones. By originality we violate no obligation if we conform to the requirement of the Pharmacopœia, as any methods which make for better results are signs of progress.

Pharmacy has no limitations in progress; its fields are ample for the most ambitious, and although the rewards may not be as great as in other fields, we still have the satisfaction of benefiting others through our efforts. Keen and resistless efforts are ours to use if we will; with practical pharmacy as our text it is for us to arouse the physicians to our attainment and again secure what we have in a measure lost through apathy.

Shall we leave the development of pharmacy entirely to the large pharmaceutical houses, as well as the host of smaller ones, who vaunt the superiority of their products to the physicians, and at the same time take more or less occasion to decry the ability and honesty of the pharmacist.

The physician has little knowledge of pharmacy, and it should be our aim to so interest him in the possibilities and importance of our vocation that he will be forced to recognize the professional character which we give that work, and thereby impress upon him a greater respect for our scientific attainments. His prescription should be studied, and improvements in combination and adjuvants be suggested, and the fact that we are competent and progressive be constantly brought to his notice, not only by words, but by the superiority of our dispensing.

The dispensing department demands of us clean-cut, reliable and intelligent methods vigorous and decisive efforts to improve in all possible directions, carefully selected dispensers, men whose heart is in their work and who will give that attention to details which tends to produce perfect results. The dispensing department is the keystone of pharmacy, and many of us will rise or fall by the conduct of that department, as the physician can do much to make or unmake a pharmacist. This department under modern conditions does not give the dispenser the opportunity for the display of his ability which he formerly obtained—the dispensing of proprietaries and synthetics being so large a part of his duties. Shall we make no effort to overcome this condition, and take no steps to solve this as yet unsolved problem? It is my belief that the multiplicity of these proprietaries will be the very means of their ultimate abandonment, and their present unlimited use will be largely curtailed; in fact, in the not far distant future the physician will consider their use as unethical.

If present conditions continue to prevail, we may well ask ourselves the question, have we reached the end of our usefulness as pharmacists in all that term implies? have we come to be a mere convenience for the producers of proprietaries and the physicians, or are we still professional pharmacists, and shall we demand recognition as such? Can such a demand be made, and are we in a position to enforce such a demand? It is

doubtful. But such a demand will be made in the near future, when higher education has accomplished its task, and when the uneducated boy will no longer have a place as an apprentice in a pharmacy. We must be in a measure content until higher educational methods have taught both the physician and the public that pharmacy is a profession and demands proper recognition as such. Then, and not till then, will the physician recognize in the pharmacist a valuable ally in fighting disease, and he will also come to a full consciousness of the fact that medical science has two distinct and separate branches, and that he has no place in the domain of pharmacy; neither will the pharmacist infringe on the prerogatives of the physician. Each must come nearer to the other and to the ultimate benefit of both, and with a resultant benefit to the public.

The last revision of the Pharmacopœia, and the forthcoming revision of the National Formulary afford a most excellent opportunity for forceful work along pharmaceutical lines, and we should accept the incentive for effective work and with such vigor as to produce substantial results. It was my purpose to take up some of the time of this Section for work along pharmacopœial lines, but the delay in the issuance of the Pharmacopœia has made it practically impossible to carry out any work in that line. This I regret, as much that was interesting and instructive would have been brought out.

This Section has its own special field of work. It has and will continue to play an important part in the work of the Association, as it gives strength to the assertion that the purpose of the Association is to improve the science and art of pharmacy.

In appealing for the support of the pharmacists of this country, the Association can give no surer evidence of a reason for its existence than that we are not reaching over the heads of the pharmacist, but that we are rather giving him practical and reliable information which is of practical and consequent commercial advantage in his every-day work. It is the aim and purpose of this Section to give attention to essentially practical matters connected with the daily work of the pharmacist. The Section has great opportunities to be of service along these lines, but in order to accomplish its mission, it must have the hearty and continued support of the pharmacists of the Association; the special value of the work done here lies in the significant points brought out by discussion of the successes and difficulties met with at the dispensing counter.

The battle is not always to the strong, neither are the greatest achievements accredited to the wisest among men, but even the humblest are at times the teachers of those more learned. It often happens, however, that through diffidence, the man who has ideas which would be of value to his co-laborers, fails to proclaim them and, therefore, we are left in ignorance of facts which would be of great service.

I trust that that feeling will not prevail here, but that each and all will give of what he may have, which will be of benefit.

Pharmacists, this Section was created for you and your benefit; see to it that it has your enthusiastic and continued support.

I desire to express my appreciation of the support which I have had in the position of Chairman, and regret that a combination of circumstances, over which I had no control, did not allow me to secure larger and more abundant results in the work of the Section.

The chairman's address was greeted with applause, and, on motion of Mr. Hallberg, it was ordered received and referred for publication.

Mr. Rapelye resumed the Chair.

The Chair called for the report of the Committee on National Formulary, which he said had been referred to this Section by the Association in general session. Mr. Diehl, Chairman, had the report, but explained that it had already been read in the general session, where it really belonged. Mr. Scoville, of the committee, stated that in past years it had

been customary to refer the report to this Section, because it was of particular interest here, but that this year the report referred more particularly to the general session. Thereupon, Mr. Hallberg moved that the report be referred back to the general session, and Mr. Scoville seconded the motion, and it carried.

The reading of papers was announced as the next order of business, and Mr. W. F. Kaemmerer, of Columbus, O., was called on to present a paper entitled The Revelation Prescription Case. Mr. Kaemmerer took the floor and proceeded to explain his subject in detail, with the help of some large charts or drawing which he put up on a stand before the members. One of the prominent features of his novel prescription case was a plate-glass front, so the public could see what was going on behind the case. The text of his paper here follows:

THE REVELATION PRESCRIPTION CASE.

BY WILLIAM F. KAEMMERER.

So called because I believe it will prove itself a revelation in more ways than one. It certainly has been a revelation to the public because, rarely have they been invited to observe the compounding of prescriptions from start to finish.

Before going into the details of our prescription case, I will give a few reasons for devoting so much time and attention to our prescription department.

We regard it as the foundation of our business success, and I believe rightly so. People judge everything about a pharmacy by the quality of work and service they receive from this department.

The manner in which this branch of our business has been conducted has given us a prestige and a standing in the community which could not have been obtained in any other way. We have every confidence in the future. I believe there is a brighter outlook for the dispensing pharmacist. The past two years have witnessed great influences at work which are destined to have a most favorable influence on the business of the dispensing pharmacist. It only remains for us as pharmacists, to be prepared to take advantage of this circumstance.

When we began to plan for our new prescription department we decided to have a prescription case which would enable us to accomplish certain objects we had in view.

Inasmuch as this was our greatest and best advertisement, we decided that we would have a prescription case that would have an attractive appearance and also create the greatest amount of favorable comment. Exclusiveness was another desirable feature to be obtained, and arrangements were made by which we could exclude everybody from the prescription department who did not belong there.

As we were limited for space it was to be built so that we could utilize

every inch of space to the best advantage. The most important object to be obtained was in regard to cleanliness. We decided that we would have the cleanest prescription department to be found anywhere. In compounding prescriptions we would make no distinction between those which were intended for diseases of the eye and those which were to be used for other purposes. In compounding all prescriptions we would observe the same degree of accuracy in weighing and measuring, the same care in the selection of materials, and the same absolute cleanliness as we would if they were all intended as eye preparations.

We decided also to depart from the conventional method of working behind a screen or mirror, and instead of the usual mirror or screen, you will see a very large and clear pane of heavy plate-glass, thus affording an unobstructed view of the interior of the prescription department, so that all can see for themselves how absolutely clean everything is kept. We are not ashamed of anything that we do, and see no reason why we should hide behind a screen. We are proud of our work, and want the public to see just how we work and to observe how clean everything is kept. One end of our prescription department faces the street, where we also have a show window from which another unobstructed view of the interior of the department can be obtained. We have an abundance of light, so that there are no dark corners in which dirt may accumulate.

This show-window I utilize strictly as a pharmaceutical window and always manage to have a clean, attractive display and a change every week.

The field here for making attractive and profitable window displays of pharmaceutical preparations and processes is practically unlimited, and a good paper could be written on this subject alone.

How well our plans have been carried out, and how nearly we have accomplished the objects we had in view, may be judged from the following description:

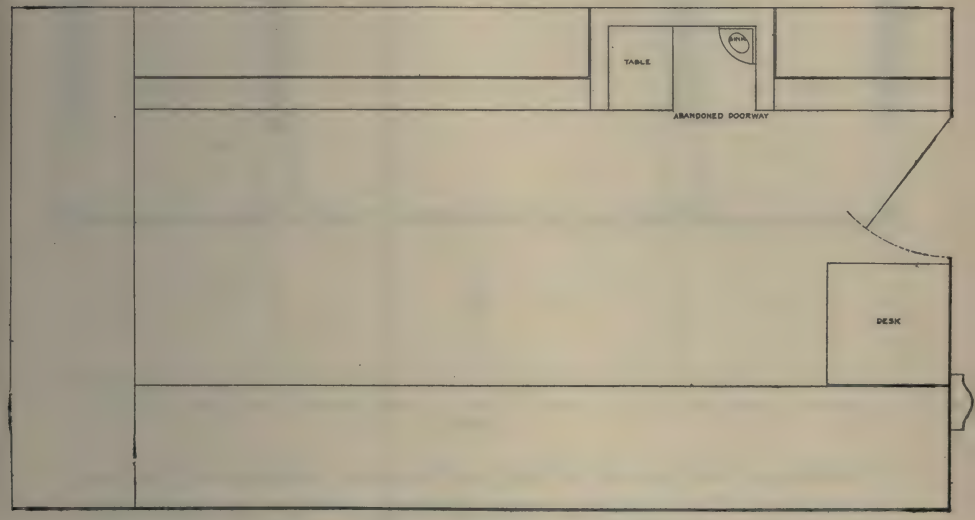
Of course it is impossible to describe in words the handsome and attractive appearance of our prescription case. I can only say that it must be seen. A photograph would perhaps give you some idea as to how it looks. I found it impossible to get a good photograph on account of there being too much reflection due to the large amount of glass used and the high degree of polish on the wood.

By examining the charts here you can get a fair idea as to what the case is like. These charts are made from drawings used by the builders.

Figure No. 1 shows what might be called the floor plan. It merely shows the position and amount of floor space occupied by each section. The whole space measures only thirteen by seven and one-half feet. The bottom of the figure shows the space occupied by the prescription case proper. The right side of the figure shows the entrance and space occupied by the writing-desk. Just above the desk is a small window for receiv-

ing prescriptions and giving out checks. The top of the figure shows the space occupied by the wall case. It also shows an abandoned doorway taken up by the sink and a table. The left of the figure shows a continuation of the work-board of the prescription case, and extends across the back of the window previously mentioned. The window is not shown in the drawing but extends two and a half feet out in the street. Another thing not shown in the drawing is a large drawer under the window. This

FIG. 1.



PLAN

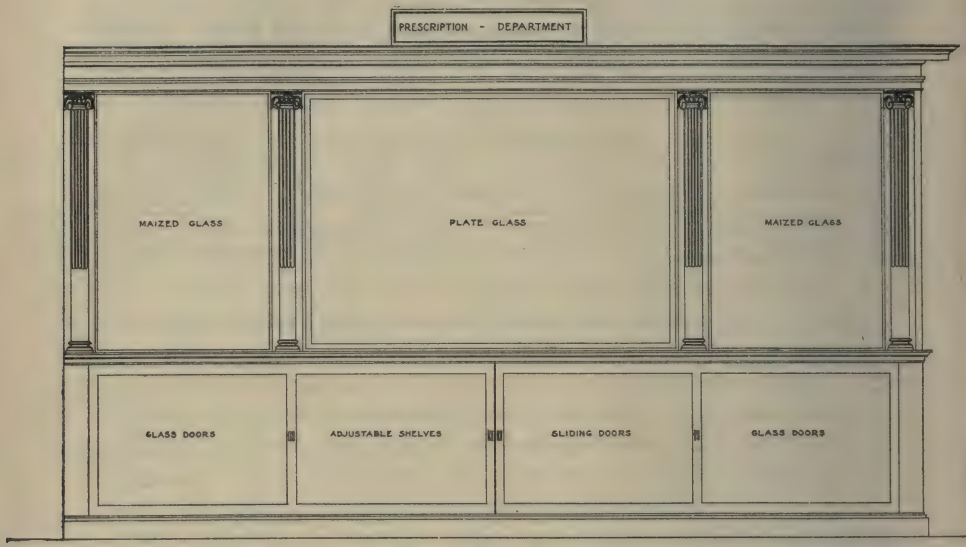
drawer is divided into two compartments. One compartment I keep filled with clean sawdust for cleaning greasy mortars and graduates. The other is for receiving scraps of paper and other waste material. We allow no waste paper or litter of any kind to be thrown on the floor. The free floor space inside measures about four by eleven feet, and is covered with heavy linoleum.

Fig. No. 2 shows the front elevation. The most striking feature here is the large pane of clear plate-glass measuring forty-four by fifty-three inches. The bottom of the figure shows the sliding glass doors with adjustable shelving inside. We utilize this space to display toilet soaps and face powders. The doors rest on ball-bearing rollers and slide very easily. The side of the case is finished the same as the front. A drawing of it would show a door and a small window for receiving prescriptions. Below the window it would show two more sliding doors, the same as those in the front part of the case.

Fig. No. 3 gives us a back view. The most striking thing about this part of the case are the bottle bins and cork drawers. They are not all

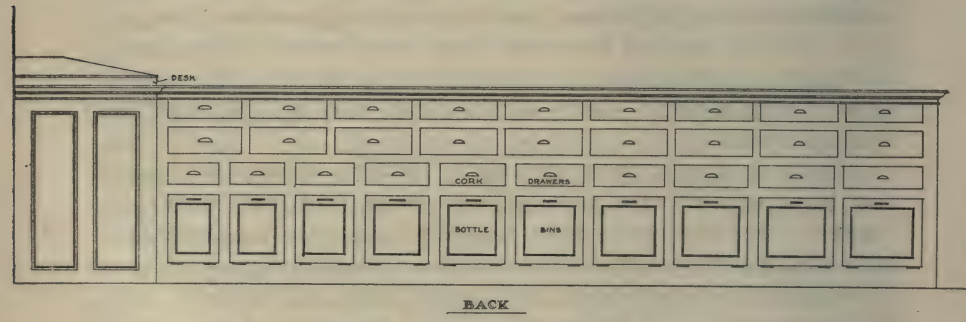
of the same size. There are separate bins for the different sizes of bottles, ranging from one-half ounce to thirty-two ounces. Above each bin is a drawer to contain the proper size corks for the bottles in the bins below.

FIG. 2.



The writing desk is also shown here, and is placed just inside of the door Below the desk are two small drawers for labels, and also one large closet. The other drawers shown here are for powder and pill boxes, powder-

FIG. 3.

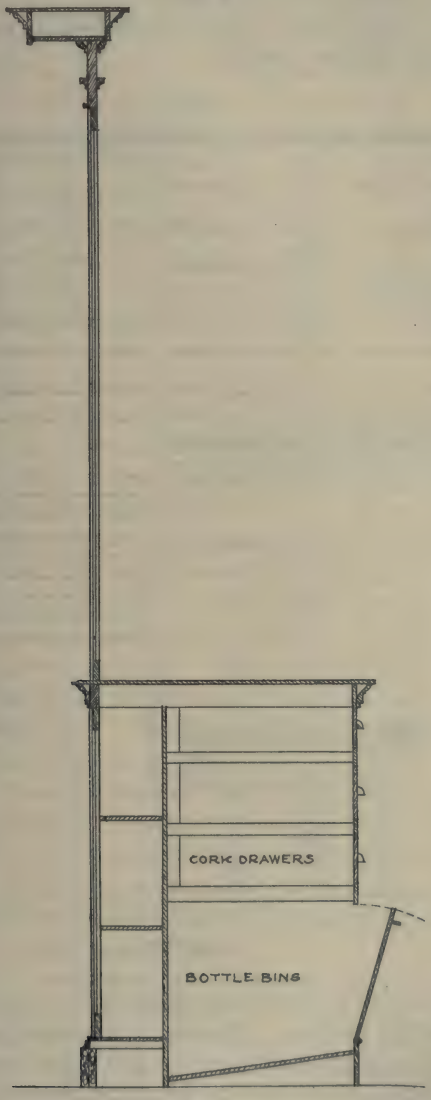


papers, twine, bottle-caps, pill machine, or whatever useful article you may choose to put into them. As we have plenty of drawers I use two of them, one at each end, for powder papers, bottle caps and twine.

Fig. 4 simply shows a sectional view of the prescription case. It shows the case divided into two parts. The front shows the shelving behind the

glass sliding doors. The back shows the bottle-bins and drawers above. The doors of the bottle-bins have spring hinges, and are self-closing, so as

FIG. 4.



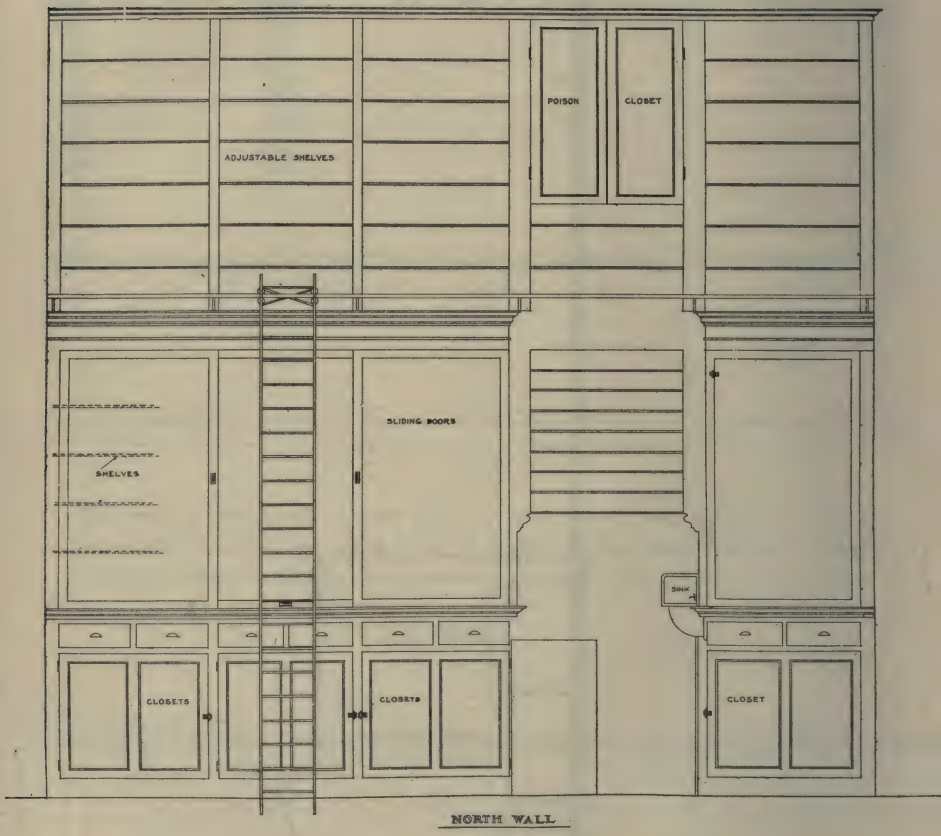
SECTION

to prevent them from dropping on the floor and being tramped upon and perhaps broken.

Fig. No. 5 shows the wall case with running ladder. At the top reached

by the ladder is a lot of open shelving and a poison closet. Below are cases with glass sliding doors and adjustable shelving and at the bottom are numerous drawers and closets. Directly in under the poison closet is an abandoned doorway extending inward about two feet. The upper part of this space is taken up with a lot of small shelving and the lower part is occupied by the sink and a table.

FIG. 5.



To the right of the abandoned doorway is shown a closet with glass door and adjustable shelving. Because it is convenient to the sink I use it as a place to keep graduates, mortars and other utensils. There is one rule in our prescription department which we insist upon and that is that whoever uses a graduate, mortar or a spatula must also clean it and put it back in its place. Another rule we insist upon is that everything about the prescription department must be kept perfectly clean, everything, no matter whether of wood, metal or glass, must not only be kept clean, but polished as well.

Mr. Alpers moved to receive the paper.

The presentation of this paper precipitated a long discussion on prescription arrangements and facilities, and some of the speakers went into detailed account of the various devices used by them to save labor and to get the best results from limited space. Mr. Sheppard opened the discussion by commending the idea of having the prescription work open to the inspection of the public, and Mr. Cohn agreed with him in this view.

Mr. Alpers thought it would be an improvement to leave out even the plate-glass front advocated by the author. He could not understand why the majority of druggists spoiled the beauty and effect of their stores by putting a screen across the center, thus making the impression of a small store where many of them are already of shallow depth. His own store was seventy feet in length, with not only nothing to obstruct the view, but a large mirror at the back to increase the impression of ample space. An open store tended to cleanliness, which was compulsory in his establishment. He especially commended the remarks of Mr. Kaemmerer on the desirability of clean spatulas, mortars, etc., and he tried to impress on his clerks all the time that it was as much a part of the business to keep their implements clean as to soil them in the filling of prescriptions, and they were required to clean everything they used.

Mr. Hopp thought it was a sheer waste of valuable time to require clerks to wash the graduates. He had a sectional bookcase placed against his prescription counter. In the upper division he kept an ample supply of one, two, three and four-ounce graduates; in the one beneath four and eight ounces, and in the lower one pints. When used, they were set aside, and the porter washed them and wiped them thoroughly dry and clean of line and put them back in place. He did not approve the open prescription-case, because it made the average clerk nervous to be watched while at work. Mr. Hopp described some of the many labor-saving devices he had in use in his two stores in Cleveland, and an effective and time-saving index system he had for readily finding any article wanted by number, without having to string them out in a line in alphabetical order.

Mr. Eliel said he had adopted a prescription-case so constructed that the public could see what was going on behind it. He described its arrangement as to the convenient care of mortars, graduates, etc., and for ready access to fluidextracts, tinctures, salts, tablets and the like, used in prescription-work or dispensing, and said that with the aid of his perfect index system, showing by drawer and compartment number where everything could be found, a stranger could come into the store and learn in fifteen minutes, without other assistance, where each and every article that might be needed in compounding prescriptions or otherwise could be found. One of the attractive features of his store was its plate-glass shelves, which not only made a handsome effect, but showed dust or dirt at once, and thereby tended to cleanliness. He inveighed against the vast

array of bottles to be found on the shelves of the average drug-store; not over one-fourth of them were actually used, and many of the drugs ordinarily put in bottles should be placed in drawers, where the action of light would not cause them to deteriorate.

Mr. Hynson said his prescription department was up-stairs, which had the advantage in the hot summer days of allowing the prescription clerks to disrobe and make themselves comfortable. The great disadvantage was, that it required more men, which meant increased expense, a thing always to be avoided if possible. Where, in his case, it took two men above and two below, they could probably get along with two or three if the prescription department was on the lower floor. As to the care of graduates and other implements, he did not believe in taking up the time of an $18-a-week man to do a $4-man's work; therefore, he had his porter wash his graduates, of which he always kept an abundant supply on hand and told his prescription clerks to use them freely. He thought the practice of keeping bottles in bins tended to nick them, and his orders were to throw out all nicked bottles, as they were dangerous; he had had his own finger badly cut once by a nick in a bottle.

Mr. Fisk spoke against the common practice of placing the prescription-case as far back towards the rear of the store as possible, and pointed out the loss of time and inconvenience in many ways resulting therefrom. He described the very satisfactory arrangement of the establishment with which he was connected in Chicago, where the prescription-case was on one side of the store and near the middle.

Mr. Beringer, seconded by Mr. Boring, moved that the paper of Mr. Kaemmerer be referred to the Committee on Publication, and it was so ordered.

Mr. Chas. Caspari, Jr., presented in abstract the following paper on the subject of a combination percolator, by Mr. H. M. Gordin, of Chicago, and explained the operation of the particular device described by the author:

A COMBINATION PERCOLATOR AND SHAKING TUBE FOR THE ASSAY OF ALKALOIDAL DRUGS.

BY H. M. GORDIN.

For the alkaloidal assay of coca leaves the U. S. P. of 1900 directs to shake the powdered leaves in an Erlenmeyer flask with a mixture of ether, chloroform and ammonia, and then transfer the mixture of drug and liquid to a small percolator, in which the drug is exhausted by percolation with ether-chloroform.

It is easy to see that there lurks a source of error in this transferring of the mixture from one vessel to another, particularly in the case of ethereal liquids which have a great tendency to "creep."

In order to avoid this source of error I have devised a simple apparatus,

by means of which both the shaking and the percolation of the drug with the ethereal liquid can be carried out in one and the same vessel.

The apparatus consists of a cylindrical tube 20 Cm. long and 2½ Cm. inner diameter. This tube is surmounted at one end by a short, narrower tube 1 Cm. long and 1¾ Cm. inner diameter, and at the other end by another short tube 3 Cm. long and 1¼ Cm. inner diameter. At the juncture of this tube with the body of the apparatus there are three indentations in the glass. The tube is made of strong glass 1 Mm. thick.

The tube is used in the following way: A piece of cotton is placed in a small piece of cheese-cloth, and then pushed up into the narrower short tube so that the plug reaches the indentations and closes the tube rather tightly.

The plug is then followed by a pellet of cotton, and the tube closed by a good perforated cork, through which passes a thin glass stop-cock.

After closing the stop-cock the drug is weighed out directly into the tube through the open, wider end, and after adding the liquid and stoppering the tube with a good cork, the whole can be thoroughly shaken without fear that the cotton plug will be dislodged.

After shaking the tube the prescribed length of time, the tube is set with the stop-cock downwards, and after the drug has settled the apparatus is used like an ordinary percolator, regulating the flow as desired.

When the percolation is finished the drug can be distributed over the whole tube by gentle shaking, and the menstruum absorbed in the drug distilled off by surrounding the tube with a coil of rubber tubing, through which passes a stream of warm water, and connecting the wider end of the tube with a good cooler.

Such a tube can be obtained from any dealer in chemical glassware at an insignificant cost and in any desirable size. The dimensions here given are suitable for 10 Gm. of leaves.

Northwestern University School of Pharmacy.

On motion of Mr. Hallberg, the paper was received and referred.

Another paper by Mr. Gordin, on the subject of percolation with hot alcohol was also read in abstract by Mr. Caspari, at request of the Chair:

A SIMPLE ARRANGEMENT FOR PERCOLATION WITH HOT ALCOHOL.

BY H. M. GORDIN.

Most hot-extraction apparatus have the disadvantage of being costly and breakable, and are generally suited for small amounts of drug only.

By means of the following simple arrangement any reasonable amount of drug can be exhausted with hot alcohol in ordinary percolators.

The arrangement consists in rolling a coil of rubber tubing around the percolator and passing a stream of hot water through the tubing during the percolation.

The water can be heated in a separate vessel or obtained from any other source, and the percolator kept well covered to prevent undue evaporation.

Such an arrangement requires, of course, a much larger amount of alcohol than a Soxhlet, for example, but as the alcohol can be recovered, this is no particular disadvantage.

Northwestern University School of Pharmacy.

On motion of Mr. Hallberg, the paper was received and referred for publication.

Mr. Wilbert presented the following paper on elixir of thyme:

ELIXIR OF THYME WITH BROMIDES AND ATROPINE.

BY M. I. WILBERT, PHILADELPHIA, PA.

Thyme has long been in use either as a household remedy or as a condiment. In recent years the herb itself has had little or no use in regular medicine, though the volatile oil and the stearopten derived from it have been used quite extensively. The ancients, on the other hand, appear to have used the herb much more frequently. Dioscorides devotes considerable amount of space to a dissertation on the medicinal properties of the several varieties of thyme, and among other symptoms or diseases says that it was used with much success as a remedy for coughs. While it has been generally admitted that thyme had antiseptic, antispasmodic, expectorant, sedative and tonic properties, little or no practical application of these several properties of the herb itself was made until about five or six years ago, when a German proprietary preparation, ostensibly a syrup made from a mixture of garden thyme and wild thyme, was put on the market as a specific in pertussis or whooping-cough. More recently the German "Apotheker Verein" published a formula for a compound syrup of thyme, containing in addition to thyme and wild thyme a mixture of bromide of potassium, bromide of sodium and bromide of ammonium. The preparation itself was directed to be made from the fluid extract of thymus vulgaris and the fluid extract of thymus serpyllum. The resulting mixture, in addition to being unsightly, did not appear to represent the active constituents of thyme as well as the proprietary preparation which is now being exploited in this country.

Being desirous of furnishing something that would meet the demands of the physicians in charge of the out-patient department of the Children's Hospital better than the preparation made from the fluidextracts, we devised, and for nearly a year have used, the following formula for an elixir of thyme with bromides and atropine:

Thyme	50.	Gm.
Wild thyme	50.	"
Potassium bromide	8.	"
Sodium bromide	8.	"
Ammonium bromide	4.	"
Atropine sulphate	0.02	"
Sugar	200.	"
Alcohol, 2 vols. / Water, 8 "	Of each enough to make 1.000 Cc.	

The mixed drugs, in moderately fine powder, are moistened with 150 Cc. of the menstruum and allowed to stand in a closely-covered dish for 24 hours. The moist powder, after being thoroughly well stirred and mixed, is then packed moderately tight in a glass percolator, and sufficient of the menstruum is then allowed to percolate through it to measure about 750. Cc. In this percolate the atropine sulphate and the bromides of potassium, sodium and ammonium are dissolved. The resulting solution is then allowed to percolate through the sugar, previously placed in a glass percolator, and sufficient additional percolate from the thyme mixture is subsequently added to make the total quantity of the resulting preparation 1.000 Cc.

Each teaspoonful (5 Cc.) represents a total of 0.10 of the mixed bromides and 0.0001 of atropine sulphate, and is accepted as the usual dose for a child 10 or 12 years of age.

The resulting mixture is sightly, not unpleasant to the taste, has given satisfactory results in a large number of cases, and is well worth bringing to the attention of an added number of physicians.

The paper was applauded, and, on motion of Mr. Boring, was referred to take the usual course.

At request of the Chair, Mr. G. G. C. Simms, of Washington City, presented the following suggestions as the result of his long personal experience:

PRACTICAL SUGGESTIONS BASED UPON LONG EXPERIENCE.

BY G. G. C. SIMMS.

The eighth decennial revision of the U. S. Pharmacopœia is being issued, and from a casual examination of the book I venture to say that it is destined to be a credit to all who have participated in its production, as well as an honor to American pharmacy.

It behooves all who are engaged in the practice of medicine or the manufacture and dispensing of medicinal preparations to obtain this fatest revision of the Pharmacopœia at their earliest convenience, and conform to its requirements.

Long experience in the conduct of a drug-store has led me to think that there is great laxity of caution in carrying out the requirements of the Pharmacopœia by many of those engaged in the drug business. First, in the application of heat in the manufacture of preparations, an excess of it being often used. This has been noticed particularly in the

making of ointments and solutions which require only the application of gentle heat, yet boiling temperature is frequently used.

Secondly, the requirement that certain articles must be kept in a cool and dark place and that others should be kept in dark-colored amber bottles is disregarded, the result being an explosion of some preparations like peroxide of hydrogen, and the fermentation of others, including many of the syrups. Spirit of nitrous ether, nitrohydrochloric acid, many of the tinctures and fluidextracts are injured by exposure to light and heat.

Thirdly, the Pharmacopœia is the standard for purity and strength of all official chemicals and drugs. The chemicals must be of a certain degree of purity, if not chemically pure; and many of the drugs and their preparations are required to be of standard strength and purity. This last requirement is probably more frequently violated than any other: owing to the fact that syrups, tinctures and infusions are made with fluid extracts which are not of standard strength.

All druggists are not analytical chemists, in fact but few are; it is important, then, that the most of them should buy their supplies from manufacturers and wholesale dealers who have a reputation for being reliable as well as responsible. Druggists should refuse to buy from irresponsible persons, and thus avoid the purchase of factitious, adulterated and inferior drugs and medicines.

The instructions in the Pharmacopœia in regard to the process of percolation are not always carried out, sufficient care not being taken to protect the percolate from evaporation, as well as from dust and insects.

Even the filtration of liquids is open to criticism; instead of placing absorbent cotton in the stem of the funnel, it is often laid loosely in the funnel and the liquid poured over it, the result being an imperfect operation. When filter-paper is used for larger operations, it is frequently observed that the top of the funnel has not been properly covered so as to prevent evaporation and keep out dust and insects, as well as bacteria.

Every drug-store should be well supplied with distilled water. I am sorry to think that many druggists use but little of it. It should always be used when indicated by the Pharmacopœia; also whenever the physician's prescription calls for it, either as aqua pura or aqua distillata. It should be used in eye waters and in the solution of certain chemicals, such as nitrate of silver, bichloride of mercury and acetate of lead. There are druggists who do not seem to realize the importance of keeping the distilled-water bottle clean, and not exposing the water to the deteriorating influence of the impurities of the atmosphere.

Many druggists do not realize the importance of having on hand a supply of weights and measures in the metric system. When they have occasion for the use of them, which will be very often if they make their own preparations according to the U. S. Pharmacopœia, they must con-

sult a table of weights and measures to find out what should be used in apothecaries' weight and measure. This involves a calculation which they are not always equal to, as most of us know.

Carelessness is exhibited in the improper manipulation of drugs which are to be made into pills, powders and capsules; instead of mixing the ingredients in proper order in a suitable mortar with free use of a spatula, they are placed on a slab, and are then imperfectly triturated with a spatula. Some druggists, old ones mostly, perhaps have a habit of keeping spirit of nitrous ether in pint or quart bottles on their shelves, exposed to the light, although the Pharmacopœia requires that it must be put into small vials and kept in a cool and dark place.

It may be presumed that most of the trained pharmacists, especially the graduates of colleges of pharmacy, will observe the requirements of the Pharmacopœia, but as a vast number of druggists are not graduates, and have not had the advantages of careful training, we have grave cause for fear.

Washington, D. C., August 16, 1905.

Mr. Hynson moved that the paper be received and referred to the Publication Committee, and it was so ordered.

The Chair stated that the time had now come for the nomination of officers of the Section for the ensuing year.

Mr. Hynson said he took great pleasure in nominating for the office of Chairman that happy combination of professional and commercial pharmacy, Mr. William C. Alpers, of New York. Mr. Wilbert seconded this nomination. Mr. Hallberg nominated Mr. H. A. B. Dunning, of Baltimore, but Mr. Dunning said that while he felt proud to have his name mentioned in this connection, and thanked Mr. Hallberg for the suggestion, he must decline for reasons sufficient to himself.

Mr. Hallberg then nominated Mr. Dunning for Secretary, and the nomination was seconded by Mr. Stein.

The Chair called for nominations for one Associate on the Committee, and Mr. Hallberg nominated Mr. W. O. Gross, of Fort Wayne, Ind. This motion had a second in Mr. Hynson.

On motion of Mr. Hallberg, the Section then adjourned.

SECOND SESSION—FRIDAY MORNING, SEPTEMBER 8, 1905.

The second session of the Section on Practical Pharmacy and Dispensing was called to order at 10:15 a. m., by Chairman Rapelye.

On motion of Mr. Mason, the reading of the minutes of the first session was dispensed with.

The Chair called for the election of officers as the next order of business, and asked the Secretary to read the names of the nominees at the

first session. The Secretary read the name of Mr. W. C. Alpers, of New York, for Chairman; that of Mr. H. A. B. Dunning, of Baltimore, for Secretary, and that of Mr. W. O. Gross, of Fort Wayne, Ind., for Associate. Thereupon, Mr. Wilbert moved that the acting Secretary cast the ballot of the Section electing these gentlemen to the offices designated, but Mr. Mason said it might be embarrassing for Mr. Dunning to vote for himself, and moved by way of amendment that Mr. Geo. M. Beringer be requested to cast the vote. This motion prevailed, Mr. Beringer announced that he had cast the ballot as directed, and the Chair declared the three gentlemen named duly elected officers of the Section for the ensuing year.

The reading of papers was announced as the next order of business, and the Chair called on Mr. Fisk, of Chicago, to read a paper entitled, "Echoes from the Compounding Laboratory," which he did:

ECHOES FROM THE COMPOUNDING LABORATORY, OR SIDE LIGHTS ON SOME GALENICALS.

BY FRANK E. FISK, PH. G.

The custom on the part of pharmacists of interpreting literally the working formulæ of the Pharmacopœia, though commendable as a rule, often proves a serious handicap by obscuring the shorter, not to mention better, methods of reaching a common goal. Among the half thousand or more official galenical preparations, comprising the several well known classes, are many which are presumed to be, and many others that are, the better for being made by extemporaneous methods, and while the working formulæ of the Pharmacopœia, if closely observed, will usually result in a satisfactory preparation, a shorter equivalent method, skillfully handled, will often prove equally serviceable, with a material saving of time, a factor that should always be reckoned with in the dispensing laboratory, since the material success or failure of the apothecary often hinges on the advantageous use of the time of those regularly employed. The instances necessitating the use of these short methods in compounding are of most frequent occurrence with such of the official preparations as are so seldom called for as not to justify the pharmacist's keeping them ready made, or the other extreme, viz., such as are extensively used and often wanted in considerable quantity, for example,

TINCTURA OPII CAMPHORATA, U. S. P.

This ever-popular preparation, containing but little more than five per cent. of active constituents, including the glycerin, and whose insoluble constituents amount to less than one-half per cent., is, according to the official process, given a three days' period of maceration, followed, of course, by filtration, whereas its exact equivalent may be produced in three minutes or thereabouts, the only deviations from the official formulæ being the use of 40 Cc. of the assayed tincture instead of its equiva-

lent, 4 Gm. powdered opium, the process being hastened by dissolving the camphor and benzoic acid and anise oil in the alcohol, adding glycerin, then gradually the water, and lastly the opium tincture, making allowance, of course, in the measure of alcohol and water for the volume of the tincture used. Another instance where an equivalent formula may well take the place of the official with a number of advantages is in the manufacture of another exceedingly popular member of the official class, spiritus, viz.,

SPIRITUS AMMONIÆ AROMATICUS, U. S. P.

The exceedingly variable character of this valuable preparation, as found in the apothecary shops of the country, is by no means generally appreciated, nor is the exceedingly delicate chemical nature of the essential oils entering into its composition, which in a great measure accounts for their proneness to decomposition, and, coupled with the lax custom of pharmacists in selecting the ammonium carbonate used, explains the variations of odor, color and taste of the product as we find it, and suggests a remedy which may be applied as in the other instance so as to shorten the process and insure both uniformity and unquestionable improvement in the preparation as a whole, whilst closely conforming in color to the official product after submission to what pharmacists call the aging process. The remedy suggested is as follows. Select from the interior of large crystals of the carbonate portions quite free from effloresent portions, quickly reduce to powder, transfer to suitable flask containing ammonia water previously diluted with distilled water, as per U. S. P. formula, and dissolve by agitation, the quantities of each for 1000 Cc. of the finished product being as follows: Ammonium carbonate, Gm. 34; Ammonia water, 90 Cc.; Distilled water, 150 Cc., respectively. To this solution add the aromatic alcoholic solution, prepared as follows: Spirit of lemon, 200 Cc.; Spirit of lavender, 20 Cc.; Spirit of nutmeg, 20 Cc.; Deodorized alcohol, 480 Cc.; Distilled water, ad 1000 Cc. The superiority of this preparation is secured first by the preservation of the characteristic odor and taste of the oils in alcoholic solution, thus insuring uniformity, together with the beautifully-blended aromatic flavor, unhampered by the fusel-oil odor of ordinary alcohol, thus conforming to the alcohol requirement of the U. S. P., 1900, and secondly by avoiding largely the ammonium bicarbonate, and consequently the tendency to precipitation. The preparation may be finished within an hour, with the characteristic pale yellow or straw color imparted by the grated peel of the lemon spirit.

ACETIC ACID AND PREPARATIONS CONTAINING IT

are often subjects of investigation and discussion, such preparations

often proving puzzling problems to many "knights of the mortar and pestle," as, for example, the official

LIQUOR AMMONII ACETATIS, U. S. P.,

Which may as a matter of convenience follow the quite common custom of preparing same from stock solutions of diluted acetic acid and ammonium carbonate, so formulated as to produce a neutral solution when mixed in equal measures, quite oblivious of the importance of estimating by acidimitry and alkalimitry the exact strength of the constituents, as well as the importance of the use of the test-paper, before turning the supposedly innocent remedy over to the patient, who has received anything but specific directions from the physician concerning its use, and therefore jump to the conclusion that if a little is good, more is better, with the result widely at variance with the physician's plans, and I doubt not that there are instances where druggists have perpetuated such a blunder for a long time, the origin of the trouble usually being traceable to the acidum aceticum, which is likely to vary from 20 to 40 per cent. absolute strength, and therefore when such a solution is used in the preparation of the official liquor ferri et ammonii acetatis, U. S. P., the utter failure to produce the beautiful and palatable remedy is a foregone conclusion, and while the difficulty is easily overcome, the remedy is not likely to occur to so careless an operator, and therefore the plan of making the solution of ammonium acetate in connection with the Basham's mixture, thus insuring the freshness of the constituents, the process being somewhat simplified by the use of the glacial or practically absolute acid, as follows: Ammonium carbonate, carefully selected, 5 Gm.; Glacial acetic acid, 6 Cc.; Distilled water, ad 100 Cc., and to this solution, which is slightly acid, add, first, Tincture of ferric chloride, 10 Cc.; Aromatic elixir, 50 Cc.; Glycerin, 60 Cc.; Distilled water, ad 500 Cc., overcoming the turbidity, if any, with a drop or more of the same acid. Another well known member of the official class of Syrups, that has undergone several changes in formula within as many decades, the best of which was discarded in 1880, and is still deservedly popular, is

SYRUPUS TOLUTANUS, U. S. P.

And while the late method will usually result in a satisfactory preparation, unless it be long kept, it certainly possesses no practical advantages over the older and, as I believe, better method, which is essentially as follows: Triturate of tincture of tolu, U. S. P., 60 Cc., with magnesium carbonate, 15 to 20 Gm., and sugar, 60 Gm., thoroughly, and gradually add water, 500 Cc., with constant trituration, then throw entire contents of mortar on to filter, the absorbent powder retaining the insoluble matter. Place filtrate (tolu water) over slow fire, raise temperature to near 100° C., thus evaporating the alcohol; discontinue heat and dissolve by

the simplest method therein 1000 Gm. of sugar. This method insures stability of the product through sterilization of solvent and removal of the alcohol of the tincture, which if allowed to remain would occasion the precipitation of a portion of the sugar as crystals, due to the stronger affinity of the alcohol for the water, thus rendering the syrup likely to undergo fermentation as the result of being weakened in sugar by the precipitation. By this process the syrup may be completed in 30 to 40 minutes, whereas with the present modified formula, necessitating the making of a more concentrated alcoholic solution or tincture of the tolu balsam, more time is necessary, and precipitation and fermentation, as above likely to follow. Another important class of preparations to, which extemporaneous methods are applicable as well as justifiable are the resins—gum, resinous, and balsamic tinctures, such as guaiac, benzoin, asafœtida, myrrh and tolu. The seven days' maceration allotted to these important tinctures by the Pharmacopœia may be replaced in each instance by circulatory displacement, which will be found in every way superior to the maceration method, as well as much shorter, while in emergency cases it will be found that the tinctures fully equal in strength to the official may be produced in from 20 minutes to one hour by the following process:

Reduce drug to moderately fine powder and triturate in contact with successive portions of menstruum (alcohol), whose temperature has been raised to near the boiling-point (75° C.), using much pressure, using only a portion of the drug to each fresh portion of menstruum, throwing contents of mortar in each case on to filter and closely covering to prevent unnecessary evaporation, and after the tincture has all passed, return the moist drug to mortar and gradually add the tincture, with pressure, as before, separate the liquid by pouring through funnel containing absorbent cotton, transfer moist drug to funnel or percolator provided with porous diaphragm or filter, press lightly, if at all, and pass the tincture through same, taking the necessary precautions to limit evaporation to the minimum. Tinctures of the above-named substances, and others of the type, may be produced in from one-half to one hour that will fully equal in strength the U. S. P. products, while if reasonable precautions be observed, the loss of alcohol from evaporation will not exceed 10 per cent., which is insignificant compared to the saving of time and the other advantages accruing from its utilization as an emergency process.

Chicago, August 15, 1905.

Mr. England moved that the paper take the usual course.

Mr. Alpers discussed the paper at length. He said that such papers were always interesting and would be listened to attentively, and were certainly, also, of some use; but, speaking generally, he doubted whether

it was a wise thing to do to recommend deviations from the methods established by the U. S. Pharmacopœia. In the hands of the skillful manipulator, the formulas of the Pharmacopœia might sometimes be modified or shortened, but it was a dangerous field for the careless or over-confident young man to enter upon. If the principle prevailed at all, the question was, where was the line to be drawn? He knew it was the custom in many stores to have such abbreviated formulas, and he admitted he had some himself, but it was a dangerous doctrine to preach. It was a matter that should rather be left to the judgment of experienced men. He argued that aromatic spirit of ammonia should not be made as recommended by Mr. Fisk, and he doubted whether any time would be actually gained by the process advised. He commended the idea of circulatory displacement as opposed to maceration, in connection with gum-resinous and balsamic tinctures, and expressed disappointment that in the new Pharmacopœia such methods had not been used freely; a good many papers had been written on the subject in the last ten years, and he believed that preparations of full strength and elegance could be made in that way. The mucilage of acacia could be made much better in that way. He had found it a great convenience, where certain preparations were used in large quantities, to make them four times the ordinary strength, diluting them with water as needed. This was notably true of some unofficial preparations.

Mr. Wilbert agreed with Mr. Alpers that it was a dangerous thing to advocate the use of extemporaneous methods, differing from those fixed by the Pharmacopœia, in the making of preparations. Then, referring to the author's recommendation of 6 Cc. of glacial acetic acid as a base in his solution of ammonium acetate, he criticized this suggestion, because of the extreme difficulty of measuring such small quantities, and in potent medicines it was a dangerous thing to attempt. It was much easier to measure 30 Cc. than 6 Cc.

Mr. Dunning, in speaking of ammonium acetate solutions, said he had found in neutralizing ammonium carbonate with acetic acid it was very difficult to determine when neutralization had taken place, on account of the large amount of free carbonic acid gas left in solution. He attempted to make use of an indicator of some sort, so that by removing a certain amount of the solution and adding the indicator it would show by color-reaction whether the solution was acid or alkaline. He did not know of any substance which would indicate that, for the reason that either the ammonia acts on the indicator, or the carbon dioxide, or the acetic acid, so the reaction is not sufficiently perfect to show whether it contains free acetic acid, or ammonia, or what not.

Mr. Beringer said that, for ordinary purposes, the solution should be slightly acid.

By invitation of the Chair, Mr. Dunning read the following paper on iron and manganese peptonate:

SOLUTION OF IRON AND MANGANESE PEPTONATE.

BY H. A. B. DUNNING.

The popularity and apparent efficiency of this preparation as a means for the exhibition of iron and manganese, indicates that it is likely to occupy a permanent place in our Materia Medica.

This conclusion seems sufficient to make desirable the construction of a formula that will yield a preparation, not only permanent and agreeable, but one which will conform to the views of therapeutists as to the best combination of the active ingredients.

To what extent the chemical nature of the numerous preparations on the market conform to this standard, the writer is unable to state. Yet an examination of a number of these preparations from a physical standpoint, leads him to declare that there are but a small proportion that could be called satisfactory.

Leaving out of consideration those preparations which contained precipitates, there were others which, though clear solutions, presented a turbid appearance in reflected light, had a disagreeable organic odor, or strong salty taste. In fact, all of the preparations examined had one or more of these failings in a greater or lesser degree.

Taking note of the fact that the solution of iron and manganese peptonate, according to the manufacturers' labels, contains such a small percentage of the active ingredients, that there would be but little odor or taste of any character imparted to the solution through them, the writer naturally concluded that the organic odor was due either to careless preparation or the addition of some agent necessary to effect solution or to insure permanency, this agent also altering the taste.

Suspecting the presence of ammonia (having observed in some formula in the Journals ammonium citrate suggested), a number of the solutions were examined for its presence. This substance was found in the preparations which were clearest and most permanent.

Realizing that it would be a very difficult undertaking to ascertain much of the chemical constitution of these mixtures of organic compounds, the writer decided to study the available formulas given in the journals and text-books with the object of ascertaining the best method for the preparation of iron and manganese peptonate and the most satisfactory way to effect its solution.

Three classes of formulas were noted :

Class 1. Directs a definite amount of scale, iron and manganese peptonized to be dissolved in a suitable vehicle.

Class 2. Iron peptonate either of the market or freshly prepared, is dissolved in water and mixed with a strong solution of ammonium citrate and manganese chloride is added and a proper quantity of a suitable vehicle.

Class 3. Iron peptonate (freshly prepared by digesting egg-albumen

with hydrochloric acid and pepsin at proper temperature, until converted into peptone, is mixed with a solution of iron oxychloride and the whole neutralized), is dissolved by a little strong hydrochloric acid, and mixed with a solution of manganese glucosate and the vehicle.

Manganese glucosate solution is prepared by the action of potassium permanganate on glucose under proper conditions. This last is the formula of Dieterich.

The objection to preparations prepared according to Class 1 are decided.

The iron and manganese peptonized combination is not very stable and makes a more or less clear solution according to age, and, it is thought, a solutions of little permanency.

To Class 2, when the ready-made iron peptonate is used, there is much the same objection offered as to the foregoing, with the exception of permanency.

If the freshly-prepared preparation be directed, there is still the objection that the inorganic manganese salt is not in accordance with the conclusion of investigators along this line. Besides, it is thought the use of ammonia in organic mixture is apt in time to give rise to disagreeable odors.

Class 3. The principal objection to this method is the use of mineral acid to dissolve the iron peptonate and the consequent acidity of the solution.

After a careful study of the above methods, and considerable experimenting, the writer is in the position to offer the following formula.

A description of its advantages and general characteristics, as well as an explanation of its construction, will follow.

Formula :

Egg albumen (fresh)	90.0	Gm.
Hydrochloric acid	10.0	Cc.
Pepsin	0.5	Gm.
Manganese citrate.	10.0	"
Sodium citrate	25.0	"
Iron chloride *	7.5	"
Solution of sodium hydroxide, 10 per cent.	q. s.	
Alcohol.	100.0	Cc.
Syrup	50.0	"
Oil orange	.15	"
Acetic ether	.2	"
Vanillin.	.04	Gm.
Water.	q. s. 1000.00	Cc.

Dissolve the albumen in 1000 Cc. water and strain; add hydrochloric acid and pepsin, previously dissolved in 30 Cc. water. Digest this mixture at 40° C. until no cloudiness is produced by adding nitric acid to a small portion contained in a test-tube.

* 120 Cc. solution oxychloride of iron may be used in place of iron chloride.

The iron chloride, having been dissolved in 1000 Cc. water, is added to the peptone solution, and then sodium hydroxide solution is added until precipitation is complete (which will make the mixture slightly alkaline). An excess of alkali should be avoided. The precipitate is then repeatedly washed by allowing to settle and siphoning until free of chlorides or any organic odor.

After the final washing the precipitate is allowed to settle, and the water drawn off until the mixture does not measure more than 800 Cc. The whole is then transferred to a suitable container, when the manganese citrate and sodium citrate, previously dissolved by heat in a little water, are added. This mixture is boiled until solution is effected. Allow to cool and add the oils and vanillin, dissolved in the alcohol, then the syrup and enough water to make the whole measure 1000 Cc., and filter.

Each 1 oz. contains iron 1 Gr. and manganese ½ Gr.

Solution iron and manganese peptonate prepared according to the above formula, is a clear, rich, brownish-red solution, having an agreeable, aromatic odor and a sweetish, pleasant taste. It is permanent, has no organic odor, excessive salty taste or opalescence in reflected light.

In regard to the chemical nature of the active ingredients in this solution, the writer will give the results of a number of experiments upon which the foregoing formula is based.

Without undertaking to make an assertion in regard to the chemical composition of the combination of iron and peptone, the writer will state that peptone certainly has a decided influence upon iron when precipitated in its presence by the aid of an alkali, and not only iron but other heavy metals, as copper, silver, mercury, etc.

It is, however, only the iron combination with peptone that is of interest in this paper.

As is well known, the addition of a solution of caustic alkali to an aqueous solution of oxychloride of iron will cause precipitation, the precipitate being insoluble in an excess of alkali. It is a fact that if a sufficient amount of pure peptone be added to a dilute oxychloride of iron solution upon the addition of an excess of alkali, a clear, brownish-red solution results. If there is an insufficient amount of peptone present, however, there is produced a brownish-red solution containing floccula, evidently of ferric hydroxide.

The fact that the peptone must be present in a definite ratio to the iron to produce a perfect solution with excess of alkali, seems to indicate that there is direct chemical combination rather than a molecular mixture of the two substances.

It was further learned that a quantity of ferric chloride equivalent in iron strength to the solution of oxychloride of iron used was effected in a like manner by a definite amount of peptone. It was, of course, necessary to add a larger proportion of the alkali solution. Although in dilute

solutions the mixture of iron and peptone is dissolved by the addition of an excess of alkali, in more concentrated solutions, such as are necessary when preparing the iron and manganese peptonate, this will not be the case, because of the presence of alkali chloride formed. It is, therefore, necessary in making the preparation to remove the chlorides by adding only sufficient alkali to cause perfect precipitation, and then washing precipitate until all chloride is removed.

In conclusion the writer suggests that the "solution" prepared according to this formula, will contain a double compound of iron and manganese with peptone.

The method of preparing this double compound having been suggested by the formula of F. B. Power, for making a soluble scale of iron and manganese citrate, page 937, A. Ph. A. Proceedings, 1902.

The process of Professor Power is closely followed, the first step being to prepare manganese citrate, which is mixed with ferric peptonate and sodium citrate, the whole being dissolved by the aid of heat.

Manganese citrate is cheaply prepared according to Power's formula:

Manganese sulphate	100 Gm.
Sodium carbonate	140 Gm.
Citric acid	63 Gm.

The manganese sulphate and sodium carbonate are dissolved separately in a convenient quantity of hot water.

To the manganese sulphate solution, the sodium carbonate solution is gradually but continuously added with constant agitation.

The precipitate is thoroughly washed by decantation until it gives no reaction for sulphates.

The moist magma is mixed with a little water, and all the powdered citric acid having been added, gently heated until effervescence ceases.

The writer does not think it out of place to state that he always makes use of the yolks of the eggs with a small portion of the whites for making Stokes' liniment.

Mr. Beringer moved to receive and refer for publication, and the motion prevailed.

Mr. Beringer strongly recommended Dieterich's formula as being a most excellent one for solution of peptonate of iron and manganese.

Mr. England thought the writer was in error in the idea that the use of solution of iron and manganese peptonate was increasing rapidly. His experience had been just the reverse, and exceptions had been taken to the preparation on therapeutic grounds. He also thought the proportion of white-of-egg in the formula presented was unnecessarily large and even wasteful.

Mr. Wilbert criticised the use of hydrant water in the process of washing the precipitate. He said it might be all right in Baltimore, but cer-

tainly it would not be all right in Philadelphia. Many waters contain organic salts in solution, and the proper thing to use was distilled water.

In reply to a question by Mr. Joseph L. Mayer, of Brooklyn, Mr. Dunning said he had had no experience in ascertaining whether the preparations on the market were true peptones, or whether they were albuminated; that would be an extremely difficult matter to prove. He had satisfied himself that there was no albumen in his solution by testing for it. He said, however, that he had taken up this work more with the view of getting a permanent and agreeable solution than with the idea of investigating its chemical structure.

Replying to some of the criticisms on his paper, Mr. Dunning said, referring to Mr. Beringer's endorsement of Dieterich's formula, that he had found a solution of iron peptonate labeled as Dieterich's to be badly precipitated after standing on his shelves for some time. Mr. Beringer replied that the gentleman must be referring to a certain proprietary article put on the market as Dieterich's, the formula of which was not in fact that which Dieterich had published to the world, as he knew from personal comparison. As to the salty taste characterizing these solutions, Mr. Dunning said he was satisfied it was not due to any small amount of chloride formed and going into solution, but believed it was due to the excess of ammonium citrate used. He had suggested hydrant water for the washing of the precipitate, he said, as to wash with distilled water would make the process more expensive, and he had found no objection to the use of the former in Baltimore. He said he thought his substitution of iron chloride for oxychloride was one of the most important changes made in the formula, and he expected to hear criticism upon it. Mr. Wilbert said he was not the first to use it.

Mr. Eberle presented the following paper on present-day pharmacy:

PHARMACY OF TO-DAY.

BY EUG. G. EBERLE.

Whether disregard to the needs of good pharmacy had a beginning which can be referred to by data or not, it is true that through a succession of years a spirit of indifference has been only too evident. It is unnecessary, and for me it is impossible, to point out adequate reasons for such a status, or where we may look for definite causes that produce such result, or specific acts that contribute to such condition. I will, however, make allusion thereto, my main object being to dwell upon the vantage that pharmacy has lost, which may indicate the solution by which, I believe, the problem of better pharmacy is being and will be solved. Ignorance or lack of full appreciation of the demands of our profession on the one hand and commercialism on the other have played a very active part in shaping our affairs, and I believe the day is coming when the drug-store and the pharmacy will be as distinctive as are the practice of medicine and pharmacy.

Too large a proportion of the druggists know but little of the qualities drugs possess and care less; the name, the label, is all they feel responsible for. This very fact induces those who supply them to keep these two latter attributes in sight and enables them to shade the prices when occasion demands. The dose and effect of a medicine are determined from a reliable drug, one that conforms to the standard of the Pharmacopœia; a preparation made otherwise varies as do the prices of the same drug, in name, of the market. To quote the price of a drug at from fifteen cents to one dollar per pound or a ground or powdered drug less than the whole, would not look well in the market report, but is a matter of possibility. Prices, however, do not always signify quality. The dose and effect of a galenical should have an accurate relationship to the drug from which it is made. Naturally, if not properly made it does not. These data are possibly sufficient for the intended purpose, and in order to be brief, I would ask you to allow your mind's eye to view here and there, through a succession of a score or more of years, in the field of pharmacy, not confining yourself to one store nor to one branch of the drug business, but view it as a whole.

Unsatisfactory results from compounds that had heretofore given satisfaction made the physician a willing listener to the advocate of a preparation that would do the work. At first the fanciful name and somewhat uncertain knowledge of the contents did not strongly appeal, but with expected results following and lapse of time this was forgotten, and to write one name instead of worrying the brain with more, became a convenience. That which established a source of revenue for the manufacturer cut the pharmacists' profit, relieved him of the task of compounding. It is unnecessary to call your attention to what this means financially, not only to the druggist but to the patient.

There are many preparations which the pharmacist can better afford to buy than to make, but how readily did he grasp the opportunity and delegate to the manufacturer the making of many that he should have made, perhaps even advised the physician that the goods he purchased were better than he could make with his conveniences, and to insure him of these reliable products he had put in a very complete stock. His competitors had stocked with other lines, and each one using the argument that his goods were the best, was it to be wondered at that the friendly physician designated the preferred brand, quite forgetting that there was a Pharmacopœia? Nothing but chaos could come from methods of this kind, as that which called for a preparation of one manufacturer might be a very different compound under a very similar name of another manufacturer. Meaningless names do not indicate composition. How bewildered a physician must be at times, when brands and names get mixed in his head until he finds time to consult his library of price lists. The blame for the condition which the druggist complains of rests upon both

professions. When the druggist first threw off work which was eagerly received by willing shoulders, he did not realize what this would eventually mean; nor did the physician appreciate that he was relegating to innocuous desuetude one of the important branches in the study and practice of his profession.

The remedy is being applied by the National and State representative bodies of both professions, the schools and the pharmacists individually. It consists of a stricter adherence to the Pharmacopœia and more extended use of the National Formulary. The means for accomplishment are varied in accordance with the source from which the effort emanates. In the National bodies it is through the work of its Sections, in the schools by more attention to laboratory work, and by the pharmacist individually in impressing upon the physician that he is capable to compound, that he can and does test the strength and quality of crude drugs as well as finished products. It will take time, but both professions are working to achieve the same purpose, because they see in it the elevation, if not the preservation, of their professions. The Sections of Pharmacology and Therapeutics afford an excellent and convenient opportunity for the shaping of the plans in accordance with which progress is to be made and improvement result.

This is not the only source from which we can hope for betterment of conditions; the legal qualifications should be well observed and a higher standard encouraged; the schools should exact better and longer training, and to such endeavors the individual should not only lend his moral support, but exert whatever influence he may have and whatever effort he can put forward in the cause. The work is for humanity, but in this uplifting, benefit accrues largely to the pharmacist. We judge men by their works and their thoughts expressed in words, and reversely; so to me the new Pharmacopœia speaks of an improved condition of our pursuit, and I believe the new edition of the National Formulary will not do otherwise.

On motion of Mr. Hynson, the paper was received and referred.

Mr. C. E. Caspari presented in abstract a paper by Mr. Kleinschmidt, of St. Louis, on "A Few Defects of Our New Pharmacopœia."

A FEW OF THE DEFECTS OF OUR NEW PHARMACOPŒIA.

BY A. A. KLEINSCHMIDT.

The eighth decennial revision of the long-looked-for volume has not been in our hands long enough to admit of complete and careful perusal. A few defects appear to the writer to merit a discussion even thus early. One of the most objectionable preparations in the old Pharmacopœia was tincture of nux vomica and its retention in this form somewhat modified in strength is an error. If it is proper to make this one an important galenical preparation as now directed, then there is no earthly reason why

we should not be permitted to make most simple tinctures according to the same method. What a vast amount of time, trouble, etc., would we not save and is this not a "Pons Assinorum" over the royal road to "Pharmacy Made Easy." A few words regarding the manner of producing the dried extract, the base of the preparation in question, will help to point the moral. First, by a tedious process, we are directed to make what is essentially a tincture. This by prolonged exposure to heat is converted into a dry and powdered form, and this last product is again to be dissolved in a similar menstruum from which it had previously been so laboriously separated. And thus we get our tincture, and such a tincture. If, however, an old-timer still has the idea that a tincture should represent the drug, then this preparation is far from so doing, for it at best is inelegant, dark and precipitates continuously owing to the charred extractive which imparts a caramel odor and color to the product. If the object was simply to obtain a solution of strychnine 1 to 1000, this was a roundabout way of making it. I need hardly say that here the Pharmacopœia distinctly plays into the hands of the manufacturing pharmacists, for not one of us in a thousand will ever attempt the powdered extract of nux vomica. Furthermore, why compel the most exacting assay for strychnine? The drug does not altogether depend on this one alkaloid for its medicinal activity, and an assay for the total alkaloids should have been retained, as more readily carried out. Thus the preparation as ordered by our last official guide no more represents nux vomica than does a cup of coffee made from a dried extract, the article brewed from the berry, though both the latter may contain the same amount of caffeine. If the originator of the process doubts this, let him try it. Another great error is made in changing the composition of tincture of iodine. This is bound to lead to confusion, for the old, simple alcoholic solution was, is and will be a most popular remedy and has always, if of proper strength, fulfilled its requirements. It should have been retained. The new tincture should clearly be designated as compound. This, if now dispensed, where simply "tincture of iodine" is called for will give the patient a product differing greatly from what he has always used. And why are many English synonyms omitted from the text and others retained (though many are noted in the index)?

Thus we have Rheum—rhubarb, Rosa gallica—red rose, Oleum menthæ viridis—oil of spearmint; but why Rhus glabra—rhus glabra, Rubus—rubus, Myristica, and many more—myristica?

Why introduce æthylis carbamas? How many of us have ever seen it prescribed? And what of camphoric acid and eugenol? Then, to many of us of the old guard, absynthium, good old wormwood, which however bitter, always dear and sweet to us as the very first word in the list, the first memorized and however little used (though used as much or more as ethyl carbamate), should have been retained in a purely reverential spirit

for the auld lang syne when we all tried so hard to absorb the first crumbs of materia medica.

Mr. England moved to receive and refer for publication.

Mr. England said he would like to say, with reference to the criticism on nux vomica, that he agreed heartily with the writer as to the new formula for that. He had examined quite a number of extracts made according to the official process and had found them all unsatisfactory; the tincture so made was very different from that made from the drug.

Mr. Wilbert said he was not clear in his own mind whether the Pharmacopœia required the powdered extract of nux vomica to be used or not; there was a great difference between the powdered extract and the drug. In the German Hospital, in Philadelphia, they had never used anything but the tincture made from the drug, and considered it much better. He thought the Pharmacopœial Committee had made a mistake in this matter.

Mr. Beringer quite agreed with the gentlemen who had just spoken as to the assay of some of the tinctures, and took occasion to criticize some of the synonyms of the Pharmacopœia as inconsistent.

Mr. C. E. Caspari, referring to the statement of the writer of the paper that strychnine was not the only active principle of nux vomica, said that while that fact had been pretty well demonstrated, it was by far the most important principle, and for that reason he thought the Pharmacopœia was right in requiring the assay to be made for the amount of strychnine present, and not the amount to total alkaloid.

Mr. Wilbert then read the following paper on the medicated wines of the Pharmacopœia:

THE MEDICATED WINES OF THE U. S. P.

BY M. I. WILBERT, PHILADELPHIA, PA.

Among the more objectionable features that have been embodied or retained in the recently-published eighth decennial revision of the U. S. P., the present status of the official medicated wines is not the least conspicuous.

At the International Conference for the Unification of the Formulæ of Potent Remedies, held at Brussels, September 15–20, 1902, it was agreed that in future "a potent medicament should not be prepared in the form of a medicinal wine." Among the U. S. P. wines that should properly have been discontinued under this agreement are those of colchicum seed, ergot, ipecac and opium. It should be remembered, however, that while the United States of America was properly represented at this International Conference by duly accredited delegates, the present committee on revision of the U. S. P. did not take official cognizance of the details

of the final recommendations of the Conference, and this country is, therefore, the only one of those whose delegates signed the final protocol that has not signified its willingness to abide by the details of the recommendations therein adopted.

That the provisions of the recommendations of the International Conference relating to wines was, and is, a reasonable one is amply demonstrated by the past as well as the present status of medicated wines in our Pharmacopœia. Medicated wines are undoubtedly among the oldest of our present-day galenical preparations, having been in use long before alcohol or distilled alcoholic beverages were discovered. At an early date it was found that the variable composition of different wines, or of the same wine at different periods, was directly responsible for much of the difference in appearance and efficiency of the medicinal preparations in which they were used. Varied and numerous suggestions have been made from time to time to overcome this variability in composition, and at an early date it was proposed that the addition of varying amounts of alcohol would offer the most satisfactory solution of the difficulty.

This suggestion was acted on by the Committee on Revision for 1850, and in the Pharmacopœia for that year we find that a mixture of alcohol and wine is directed to be used as the menstruum for wine of rhubarb. Even fortified wine appears to have been considered unsatisfactory as a menstruum in many cases, and in the Pharmacopœia for 1870 we find that wine of ergot and wine of ipecac are directed to be made by diluting the official fluid extracts. This latter practice, for obvious reasons, met with considerable opposition, and in the Pharmacopœia for 1880 but one official wine, wine of ipecac, is directed to be made in this way.

For more than twenty-five years the leading pharmacists of this, as well as of other countries, have advanced practical as well as theoretical reasons why fluid galenical preparations should not, and could not, satisfactorily be made by diluting fluid extracts, even in such cases where the fluid extract was made with practically the same menstruum as the proposed diluent. Where the diluent differs in composition from the original menstruum, the objectionable features become much more evident, and it has long been conceded that the production of fluid galenicals under these conditions was not consistent with good pharmaceutical principles.

In this connection it will not be necessary to recapitulate the arguments and reasons that have been advanced from time to time against this practice; suffice it to say that such eminent and capable pharmacists as Dr. E. R. Squibb, Dr. Chas. Rice, Prof. John M. Maisch and a host of others have argued, and have actually demonstrated, that the practice is, and must be, an objectionable one.

Despite these facts and arguments, the present committee on revision

has seen fit to direct that four of the five official wines of organic drugs be made by diluting fluid extracts.

In addition to being construed as an official endorsement of the now widely-followed but nevertheless reprehensible practice of diluting fluid extracts for making other fluid galenicals, this action on the part of the committee on revision will undoubtedly tend to bring these particular medicated wines, and with them many, if not all, of the other official preparations into disrepute. The direct cause for this becomes evident when we remember that for economic reasons comparatively few retail pharmacists make their own fluid extracts, and that there is strong reason to believe that at least some of the manufacturers of pharmaceutical galenicals supply fluid extracts that are not made strictly in conformity with the directions and requirements of the U. S. P. This being accepted as true, can any one venture to predict how or why the medicated wines of the future will comply with the intentions of the prescriber.

In conclucion, then, it may be asked: If wine, even stronger or fortified wine, is, as it appears to be, unsatisfactory as a menstruum, why should a present-day pharmacopœia include preparations that are not what they purport to be or what they have been?

All things considered, would it not be advisable in the coming revision of our National Pharmacopœia to admit that wine is an unsatisfactory menstruum, and to include under a general heading, medicated wines, a formula for diluting fluid extracts in definite proportion with a mixture of alcohol and wine, and thus not alone tend to comply with the spirit of the recommendations of the International Conference for the Unification of the Formulæ of Potent Remedies, but also divest our Pharmacopœia of at least some of the unnecessarily large number of formulas for galenical preparations of doubtful utility.

Mr. Hynson moved to receive the paper and refer for publication.

Replying to an inquiry by Mr. E. F. Cook, of Philadelphia, as to what countries had had the opportunity to signify their intention to sign the protocol coming from the Brussels Conference on Potent Remedies, Mr. Wilbert explained that the majority of the Pharmacopœias or official books on the continent of Europe were issued under government auspices, and that the protocol referred to was brought home by the official representatives at the Conference and submitted to their respective governments as the result of the work of that Conference. The Revision Committee appointed by these governments took the protocol under advisement, and in due time notified the Secretary of the Conference of their action upon it. In some cases the governments did not feel inclined to adopt certain provisions of the protocol, but such provisions as they did not care to abide by were pointed out definitely. The German representatives did not have authority to sign the protocol, but every formula for potent reme-

dies in the German Pharmacopœia exactly corresponded to the provisions of the protocol; the Italian Pharmacopœia recently issued corresponded very closely, and the Revision Committee offered to adopt the protocol, while the English Revision Committee adopted it with the proviso that if, before the English Pharmacopœia was again revised and put on the market, they found that any provision of the protocol varied too radically from the principle adopted, they would have the right to modify it. The United States Revision Committee, as a committee, had not taken cognizance of this protocol in any way, and the government, having no authority in the matter of revision of the Pharmacopœia, was obliged to answer the inquiry of the Secretary of the Conference that it could do nothing in the matter.

Mr. Hynson took the position that while the Pharmacopœia of the United States respects those of other countries, and hopes after a while to be in perfect conformity with them, that situation should not be forced. He believed these wines would be prescribed for some time to come, in certain localities, by the physicians, whether they were in the Pharmacopœia or not, and he did not think the Pharmacopœial Committee should be criticised for retaining them under all the circumstances; he did not believe they would have been justified in excluding them because they were not elegant pharmaceutical products and not altogether reliable, for the same criticism could be made of other preparations. The question was discussed and under advisement a long time before final action was taken by the committee.

Replying to Mr. Hynson, Mr. Wilbert said he thought the adoption of that protocol by the Conference at Brussels was one of the greatest things that ever occurred for the American pharmacist; it had reminded him of his duty to instruct the physician what was in the Pharmacopœia of the United States. Never before had they shown such interest in calling attention to the contents of this book as in this particular case, and if the Pharmacopœial Committee had committed the book entirely and absolutely to the provisions of the protocol of this International Conference, the pharmacists of the country would have had a much greater lever to press home on the physicians of the country the importance of these changes, and the fact that they could now obtain these remedies equal in strength, appearance and physical qualities to those of any other portion of the civilized world. He thought it very unfortunate that the committee had not seen its opportunity here.

At request of the Chair, Mr. Beringer presented a paper embodying his ideas as to the best method of bringing the changes of the new Pharmacopœia to the attention of the physician. The author prefaced his paper with the following remarks:

The object of this paper is to offer a suggestion to pharmacists of how each can direct the attention of the physicians in his locality to the more important changes made in the new revision of the United States Phar-

macopœia. The booklet which I am about to issue is probably only a type or example of many such that will be distributed by progressive pharmacists, who keep abreast of the times and maintain a proper professional and social standing in their community. You will perceive that it has three distinct objects in view: 1st, to call attention to the changes in the Pharmacopœia; 2d, to encourage the use of official preparations in place of proprietary remedies; 3d, to advertise my own business and specialties.

The proposed booklet is as follows:

THE IMPORTANT CHANGES MADE IN THE EIGHTH DECENNIAL REVISION OF THE UNITED STATES PHARMACOPŒIA, WITH COMMENTS.

COMPILED BY GEORGE M. BERINGER.
Pharmacist and Chemist, Camden, N. J.

After September 1, 1905, the Eighth Decennial Revision of our National Pharmacopœia becomes the authority and standard for all officially-recognized drugs, chemicals and preparations.

In the compounding of all *new* prescriptions in the future we shall be compelled to adhere to the new standards and formulas, unless the physician indicates in his prescription a preference for some other standard, make or formula. Where such preference is specified, it will be followed and no deviation therefrom permitted.

In the refilling of *old* prescriptions or copies of prescriptions written by physicians prior to September 1, 1905, the standard of the previous revision (U. S. P., 1890) will be adhered to, or such other specification as was made by the prescriber, so that his intent will be fully complied with.

The changes made in the present revision of the Pharmacopœia are in some cases quite radical, making decided differences in composition, strength, doses and appearance. The following list is published in convenient form for carrying in the pocket, and it is hoped that you will find it a useful companion for reference.

Where a physician intends to prescribe a preparation or drug different from that which is now official, I request that he indicate such preference by bracket enclosure after the item, thus: Tr. Aconiti (U. S. P., 1890) will be understood as directing the use of Tincture of Aconite Root of the previous Pharmacopœia. Mistura Neutralis (1870), or Mistura Potassii Citratis (1870), will be understood as directing that neutral mixture made with lemon-juice, as directed in the Pharmacopœia of 1870, be dispensed.

Syr. Hypophospites Comp. (N. F.) will be understood as desiring the National Formulary Compound Syrup of Hypophosphites and not the new official.

Attention is directed to the radical changes in the more potent preparations by printing these in *heavy-faced type*, and special attention should be given to the dosage in the prescribing of all such.

7th Revision. 1890.	8th Revision. 1900.	Comments.
Not official.	ACONITINA.	Crystallized ACONITINE only is officially recognized and should be dispensed with care. This is much more potent than the so-called amorphous Aconitine which was originally used and official in the U. S. P., 1870. Average dose is officially stated as $\frac{1}{400}$ grain.
Not official.	Bromoformum.	Bromoform has gained favor as a remedy in Pertussis. Official average dose 3 Mm. Emulsion with acacia and syrup of wild cherry is recommended for its exhibition.
Not official.	Cataplasma Kaolini.	Cataplasm of Kaolin, U. S. P., is intended to displace the numerous clay poultices now on the market.
Not official.	Cocainæ.	Hydrochloride of cocaine not being soluble in oleaginous bases, the alkaloid is made official and should be prescribed in oleates and other external remedies.
Not official.	Codeinæ Phosphas.	Specially recommended for hypodermatic use.
Not official.	Codeinæ Sulphas.	Preferable to the alkaloid for cough syrups.
Not official.	Colchicinæ.	The alkaloid of colchicum is gaining favor. Average official dose $\frac{1}{125}$ gr.
Not official.	Emulsum Olei Morrhuæ.	This official Emulsion contains 50 per cent. by volume of oil. The flavoring is gaultheria, which can be changed by direction of the physician.
Not official.	Emulsum Olei Morrhuæ cum Hypophosphitibus.	The same as above with the addition of 2 Gm. hypophosphites in each 100 Cc.
Not official.	Emulsum Olei Terebinthinæ.	Contains 15 per cent. by volume, no flavoring. Physician should add aromatic desired.
Extractum Nucis Vomicæ (15 per cent. total alkaloids).	Extractum Nucis Vomicæ (5 per cent. of Strychnine).	The strychnine content only is accepted as indicating therapeutic value.
Extractum Opii (18 per cent. morphine).	Extractum Opii (20 cent. Morphine).	Powdered extract of opium is now of a fixed morphine strength. Average dose given as ½ grain.
Extractum Physostigmatis (not assayed).	Extractum Physostigmatis (2 per cent. alkaloids).	
Extractum Nucis Vomicæ Fluidum (each 100 Cc. contain 1.5 Gm. total alkaloids).	Fluid Extractum Nucis Vomicæ (each 100 Cc. contain 1 Gm. Strychnine).	A very active fluid preparation of nux vomica. Average dose 1 Mm.

7th Revision. 1890.	8th Revision. 1900.	Comments.
Not official.	Glandulæ Suprarenales Siccæ.	Desiccated suprarenal glands. One part represents about 6 parts of fresh glands.
Not official.	Glandulæ Thyroideæ Siccæ.	Desiccated thyroids of the sheep. One part represents about 5 parts of fresh glands. Usually administered in tablets.
Jalapa (12 per cent. of resin).	Jalapa (8 per cent. of resin).	After the U. S. P. 1890 was issued it was found that jalap in the market would not yield 12 per cent. of resin. The present requirements of assay can be attained.
Not official.	Liquor Antisepticus.	This is a solution of boric and benzoic acids with aromatics destined to displace the numerous proprietary antiseptic fluids of similar character.
Not official.	Liquor Cresolis Compositus.	Contains 50 per cent. cresol in linseed oil soap. Makes clear solutions. Introduced to displace lysol and similar preparations.
Liquor Ferri Chloridi (37.8 per cent. $FeCl_3$).	Liquor Ferri Chloridi (29 per cent. $FeCl_3$).	
Liquor Ferri et Ammonii Acetatis (2 Cc. Tr. Ferri Chlor. in each 100 C.	Liquor Ferri et Ammonii Acetatis (4 Cc. Tr. Ferri Chlor. in each 100 Cc.).	Basham's mixture has been improved by increasing the amount of iron and ammonium acetate. It now approaches nearer the original formula which was claimed to be most efficient.
Not official.	Liquor Sodii Phosphatis Compositus.	A concentrated solution, each Cc. containing 1 Gm. sodium phosphate. A standard formula to displace numerous proprietaries.
Not official.	Oleatum Atropinæ (2 per cent. Atropine).	The oleates deserve the attention
Not official.	Oleatum Cocainæ (5 per cent. Cocaine).	of physicians and a more extensive
Oleatum Hydrargyri (20 per comt. Mercuric Oxide).	Oleatum Hydrargyri (25 per cent Mercuric Oxide).	use. The rapidity of their absorption makes them valuable vehicles for ex-
Not official.	Oleatum Quininæ (25 per cent. Quinine).	ternal medication. We are prepared
Oleatum Veratrinæ (2 per cent. Alkaloid).	Oleatum Veratrinæ (25 per cent. Veratrine).	to supply promptly any of these official oleates.
Oleatum Zinci.	Not official.	Zinc oleate has been dismissed. The powdered zinc stearate which has displaced it in practice becomes official.

7th Revision. 1890.	8th Revision. 1900.	Comments.
Opii Pulvis (13–15 per cent. Morphine).	Opii Pulvis (12–12.5 per cent. Morphine).	The morphine strength is now fixed to a small allowable variation, which will not effect the dose calculated by the physician.
Not official.	Pelletierinæ Tannas.	This remedy for tapeworm is now official. We carry several makes in stock.
Pepsinum (1 part digests 3000 parts of albumen).	Pepsinum (1 part digests 3000 parts of albumen).	Saccharated pepsin has been dismissed. Nor is any liquid preparation recognized. We recommend the Essence of Pepsin. We supply our own at somewhat less price than the proprietaries.
Not official.	Pulvis Acetanilidi Compositus.	I introduced this preparation to our physicians in 1892, and it has given entire satisfaction. It should always be prescribed in place of the mixtures of acetanilide advertised as proprietary nostrums.
Not official.	Sabal.	The extensive use of saw palmetto commands attention. We supply an excellent fluidextract and also a tincture of saw palmetto and sandal.
Not official.	Scopola (0.5 per cent. Alkaloids).	This drug, the rhizome of a solanaceous plant, is claiming considerable attention. Its close botanical relation to belladonna and hyoscyamus, as well as the chemical constituents, indicates an action intermediate between these.
Not recognized.	Scopolaminæ Hydrobromidum.	Scopola is rich in this alkaloid which is identical with hyoscine. The hyoscine hydrobromide of the market is said to be mostly scopolamine hydrobromide. Dose $\frac{1}{120}$ grain.
Not official.	Serum Antidiphthericum.	Standard of the U. S. Public Health and Marine Hospital Service made official. An ample supply of the standard makes always on hand.
Spiritus Clonoini (1 per cent. Nitroglycerin).	Spiritus Glycerylis Nitratis (1 per cent. Nitroglycerin).	The Pharmacopœia changes title only. Ours is the standard remedy, permanent and reliable.
Stramonii Folia.	Stramoninum.	The leaves only and preparations made therefrom now official. The U. S. P. 1890 directed the seeds only which did not prove satisfactory.
Stramonii Semen.	Dismissed.	
Not official.	Strophanthinum.	The intensely bitter poisonous glucoside of strophanthus. Dose $\frac{1}{200}$ gr.
Syrupus Ferri Iodidi (10 per cent. FeI_2).	Syrupus Ferri Iodidi (5 per cent. FeI_2).	The new formula is only one-half the strength, but is a more stable preparation.

7th Revision. 1890.	8th Revision. 1900.	Comments.
Tinctura Aconiti (35 per cent. of drug).	TINCTURA ACONITI (10 per cent. of drug).	*This is a very radical change. The physicians should always specify* (1890) *or* (1900) *to prevent error.*
Tinctura Belladonnæ Foliorum (15 per cent. of drug not assayed)	TINCTURA BELLADONNÆ FOLIORUM (10 per cent. of drug, assayed. 100 Cc. contain 0.035 Gm. alkaloids).	The tinctures of narcotic and poisonous drugs are now uniformly 10 per cent. of these drugs. Our tincture is made from Allen's select English leaves.
Tinctura Bryoniæ.	Dismissed.	This tincture appears to be considerably used among our physicians and we will continue to prepare it according to U. S. P. 1890.
Tinctura Cannabis Indicæ (15 per cent. of drug).	TINTURA CANNABIS INDICÆ (10 per cent. of drug.	Our tincture is made from active fresh drug. For veterinary use we recommend our fluidextract.
Tinctura Cantharidis (5 per cent. of drug.)	Tinctura Cantharidis (10 per cent. of drug).	
Tinctura Capsici (5 per cent. of drug).	Tinctura Capsici (10 per cent. of drug).	
Tinctura Colchici Seminis (15 per cent. of drug, not assayed).	Tinctura Colchici Seminis (10 per cent. of drug. Assayed; 100 Cc. contain 0.05 Gm. of Colchicine).	
Tinctura Digitalis (15 per cent. of drug).	Tinctura Digitalis (10 per cent. of drug).	This is one-third less strength, and the prescriber should increase his dose accordingly. Our tincture is made from Allen's English leaves Our fat-free tincture has advantages and is preferred by many.
Tinctura Catechu Composita.	Tinctura Gambir Composita.	The replacement of catechu by gambir, and the change in the title of the tincture should be noted.
Tinctura Ferri Chloridi (13.6 per cent. $FeCl_3$).	Tinctura Ferri Chloridi (13.28 per cent. $FeCl_3$).	
Tinctura Gelsemii (15 per cent. of drug).	Tinctura Gelsemii (10 per cent. of drug).	
Tinctura Hyoscyami (15 per cent. of drug, and not assayed).	Tinctura Hyoscyami (10 per cent. of drug. Assayed; 100 Cc. contain 0.007 Gm. alkaloids).	Our tincture is made from Allen's English leaves.
Tinctura Kino (10 per cent. of drug).	Tinctura Kino (5 per cent. of drug).	The dose should be accordingly increased.
Tinctura Lobeliæ (20 per cent. of drug).	Tinctura Lobeliæ (10 per cent. of drug).	The dose should be gauged accordingly.
Tinctura Nucis Vomicæ (100 Cc. contain 0.3 Gm. of *mixed* alkakaloids).	Tinctura Nucis Vomicæ (100 Cc. contain 0.1 Gm. of Strychnine).	

7th Revision. 1890.	8th Revision. 1900.	Comments.
Tinctura Opii (100 Cc. contain 1.3 to 1.5 Gm. Morphine).	Tinctura Opii (100 Cc. contain 1.2 to 1.25 Gm. Morphine).	Our tincture of opium is assayed and standardized. 100 Cc. contain 1.25 Gm. morphine.
Tinctura Opii Deodorati (100 Cc. contain 1.3 to 1.5 Gm. Morphine).	Tinctura Opii Deodorati (100 Cc. contain 1.2 to 1.25 Gm. Morphine).	Our deodorized tincture of opium is likewise standardized. 100 Cc. contain 1.25 Gm. morphine.
Tinctura Physostigmatis (15 per cent. of drug; not assayed).	Tinctura Physostigmatis (10 per cent. of drug. Assayed; 100 Cc. contain 0.014 Gm. alkaloids).	
Tinctura Quassiae (10 per cent. of drug).	Tinctura Quassiae (20 per cent. of drug).	
Tinctura Rhei (10 per cent. of drug).	Tinctura Rhei (20 per cent. of drug).	
Tinctura Sanguinariæ (15 per cent. of drug).	Tinctura Sanguinariæ (10 per cent. of drug).	
Tinctura Stramonii Seminis (15 per cent. of drug; not assayed).	Tinctura Stramonii (10 per cent. of *Leaf;* assayed; 100 Cc. contain 0.03 Gm. alkaloids).	
Tinctura Strophanthi (5 per cent. of drug).	TINCTURA STROPHANTHI (10 per cent. of drug).	*Note:* This tincture has been doubled in strength. Our tincture is prepared from selected, true Strophanthus Kombe, and before extraction the disagreeable fat is removed with petroleum ether, and our preparation is, therefore, *not apt to nauseate.*
Tinctura Tolutana (10 per cent. of drug).	Tinctura Tolutana (20 per cent. of drug).	
Tinctura Veratri Viridis (40 per cent. of drug).	TINCTURA VERATRI (10 per cent. of drug).	The reduction in drug strength in this preparation has minimized its action, as the alcohol present is sufficient to overbalance the drug action. To obtain positive action we recommend the fluidextract or the specifying tr. veratri (U. S. P., 1890). See also veratrum.
Unguentum.	Unguentum.	Now directed to be made with white wax instead of yellow wax.
Unguentum Acidi Carbolici (5 per cent. with ointment as base).	Unguentum Phenolis (3 per cent. with white petrolatum as base).	
Unguentum Acidi Tannici (20 per cent.; base, benzoinated lard).	Unguentum Acidi Tannici (20 per cent.; base, glycerin and ointment).	

7th Revision. 1890.	8th Revision. 1900.	Comments.
Unguentum Sulphuris (30 per cent. washed sulphur).	Unguentum Sulphuris (15 per cent. washed sulphur).	
Veratrum Viride. Rhizome and root of V. Viride (Solander).	Veratrum. Rhizome and roots of Veratrum Viride (Acton) (American Hellebore, Veratrum Album, L., White Hellebore).	I do not approve of the recognition of both hellebores under one title. The identity of the two plants, either botanically or as to chemical constituents, or as to the therapeutic action, is not satisfactorily established. I shall continue to make all preparations from selected *American hellebore*, and sell the white as an insecticide.
Not official.	Vinum Cocæ. Represents 6.5 per cent. Coca.	Should be prescribed instead of the uncertain proprietaries.
Vinum Colchici Radicis (40 per cent. of drug).	Dismissed.	The reason for this dismissal is not understood. It is extensively used, and we shall continue to supply a satisfactory article in accordance with the U. S. P. 1890.
Vinum Colchici Seminis (15 per cent. of drug).	Vinum Colchici Seminis (10 per cent. of drug).	
Vinum Ergotæ (15 per cent. of drug).	Vinum Ergotæ (20 per cent. of drug).	

LIST OF SYNTHETIC CHEMICALS INTRODUCED.

The use of the official title is commended.

7th Revision, U. S. P. 1890.	8th Revision, U. S. P. 1900.	Comments.
Not official.	Acetphenetidinum.	Acetphenetidin is the chemical name for the product commonly called phenacetin or paracetphenetidin.
Not official.	Æthylis Carbamas.	Ethyl carbamate is the official title for the urethane, used as a soporific.
Not official.	Antipyrina.	ANTIPYRINE is now officially recognized, the average dose given as 4 grs.
Not officiial.	Bensosulphinidum.	The *saccharin* official is the *pure* anhydride, orthosulphamide-benzoic acid. The average dose officially stated is 3 grs., which is in excess of that generally given. Usually dispensed in tablet form with sodium bicarbonate to increase solubility.
Not official.	Chloralformamidum.	Commonly known as Chloralamide. Used as a soporific. Dose, 15 grs.
Not official.	Guaiacolis Carbonas.	Guaiacol carbonate, the true chemical name for the proprietary duotal.

7th Revision, U. S. P. 1890.	8th Revision, U. S. P. 1900.	Comments.
Not official.	Hexamethylenamine.	This is the official name for the definite chemical that has been offered to medical practitioners under about a score of fanciful names, as, Urotropin, Uritone, Formine, Hexamine, etc. The official name is rapidly gaining in favor.
Not official.	Iodolum.	Iodol, the iodine derivative of the base pyrrol appears to be going into disuse.
Not official.	Methylthioninæ Hydrochloridum.	Methylene blue, and this English synonym is officially recognized.
Not official.	Sulphonethylmethanum.	This is the chemical known as trional, recommended as a hypnotic. Dose 15 grains.
Not official.	Sulphonmethanum.	This is the equivalent of sulphonal, another patented hypnotic.
Not official.	Thymolis Iodidum.	Thymol iodide is the official substitute for aristol and the other commercial iodides of thymol. The most valuable antiseptic dressing is thymol iodide (Beringer).

The paper was applauded, and Mr. Wilbert moved to refer to the Publication Committee, and it was so ordered.

The Chair stated that there had been requests from several parties for an expression of opinion as to what the pharmacist would do in regard to the new tinctures, as affecting prescriptions on his books previous to September 1st.

Mr. England said he thought two of the most serious changes in the Pharmacopœia were in tincture of aconite and tincture of strophanthus. The first had been reduced from 35 to 10 per cent., and the last had been increased from 5 to 10 per cent. He pointed out the great danger that might result to the sick from the failure of physicians to observe these changes, and thought it was the duty of every pharmacist to take up the work at once of advising the physicians in regard to them. At his instance, a prominent Philadelphia house had sent out 25,000 circulars, containing comparative tables of the strengths of the Pharmacopœia, to the retail druggists of the country, for distribution to the medical profession, and he thought it would be well if other manufacturers would do that.

In this connection, Mr. Hynson exhibited and explained a little pamphphlet gotten out by his firm on the changes of the new Pharmacopœia, and called attention to the opening paragraph, giving notice that on refilled prescriptions written previous to September 1st, they would continue to use preparations conforming to the 1890 edition of the Pharmacopœia. He stoutly defended this position, and said no other was tenable, in his

judgment, as it would be absurd to refill a perscription with preparations of a different strength from those used originally, and he did not believe any court or jury would fine a man for doing so, nor would he be liable in damages.

In answer to a question of Mr. Wilbert as to whether he would refill a prescription without an order from the physician,—prescriptions calling for potent remedies, such as aconite, digitalis, etc.,—Mr. Hynson said he would, except for narcotics, like morphine, cocaine and such things as would tend to establish a habit.

The Chair called on Mr. Hallberg to present a paper on cresol and its solutions which he did in verbal abstract, introducing his subject with the relation of a personal experience that brought home to him how many articles of this kind, nearly alike in composition and use, are required in the modern pharmacy :

CRESOL AND ITS SOLUTIONS.

BY C. S. N. HALLBERG, PH. G.

A friend of mine who operates a fine pharmacy, and has a larger stock than the average pharmacist has, one Saturday night received a prescription for "Cretol," four ounces, use as directed. He didn't know what it was, and he could not communicate with the physician, who was out of the city. The patient needed the preparation badly. He telephoned around to some of the stores, but they didn't have it—in fact, if he didn't have it, it was not likely to be had in the neighborhood. I said to him, "You have got at least six preparations almost identical with this ; let's see how many you do have?" So we found that he had eight preparations of cresol in soft-soap solution. I said, "Explain to your customer, who knows you as well as he knows the physician—you have his confidence just as much as the physician has—that this preparation is for antiseptic purposes ; that you haven't this particular make, and it is impossible to get it until Monday, and that you will give him something like it." "No, sir!" he would not do it. "I never substituted in my life, and I am not going to begin now." So the patient was notified, and the chances are that he didn't get this preparation until Monday, unless he ran into somebody who was not quite so—what shall I call it—hypercritical.

That set me to looking into this question a little. And so I have a brief in here on this subject of cresol, with special reference to the preparation of the new Pharmacopœia.

The first acquaintance we really had with cresol was, as you remember, in the form of impure carbolic acid, which was supposed to be about equal parts of phenol and cresol. It was soon discovered that cresol, or "cresylic acid," as it was known, was superior as a germicide to carbolic acid without being so poisonous—generically spoken of as poisonous. The objection to cresol or cresylic acid was its sparing solubility in water, being

about 1 in 60, as against 1 in 19 or 20 of carbolic acid. So this was remedied by the Germans, who always seem to get on to these things—these little kinks—more quickly than we do (especially in Hamburg), by making the water solution in soap, and they introduced then a preparation called "Creolin." This creolin, I believe, does not form a clear solution with water; it is a milky solution. That is supposed to be due to the fact of its being prepared from impure cresol containing tar and to the use of rosin soap, which naturally would produce a milky solution when it is diluted with water for antiseptic purposes.

The "Lysol" type is supposed to be made with soft soap, similar to the present official preparation made with linseed oil and potassium hydroxide. And so we really have two groups.

There are a number of preparations, as you know, on the market of each of these groups. Sometimes it is a little difficult to tell just what group a preparation belongs to; thus it is difficult always to draw the line as to those that make a clear solution with water and those that do not. I have been told that this sometimes depends upon the length of time that is given to the process of saponification when made from the cresol. I have not had an opportunity to demonstrate the correctness of this. However, I think we may say, in a general way, that creolin stands for the emulsion-like mixture with water and the lysol for the clear solutions, and therefore it would be well to discriminate between these two groups. Sometimes the clear one is wanted, while for many purposes the emulsion-like form is preferred, for sheep-dip, etc. The cresol solution belongs to the clear type when a certain direction has been followed with reference to leaving it stand with the caustic potash solution; that is, it then forms a clear solution upon standing.

It has been suggested that this preparation presents endless combinations. For example, you can substitute castor oil, which forms a much more soluble preparation than other oils do, and answers, I am told, equally well, if not better, than oleic acid, and being cheaper and more convenient, should be given the preference. With this can also be combined saponified petrolatum; and combinations can be built up by the addition of aromatic oils, such as eucalyptus, etc.

Now, the principal difficulty I have encountered in trying to make this preparation was in securing the cresol. Only about a year ago, we were asked to pay $2.25 a pound for cresol. That was out of the question, because we had to have five pounds of it. In looking around, I succeeded in getting a gallon of it as a sample and used that. There is a cresol now made at Niagara Falls, which I believe answers the requirements of the Pharmacopœia, at least as to boiling-point and specific gravity. This cresol made at Niagara Falls by the Schoellkopf, Hartford & Hanna Company, can be had by the barrel comparatively cheap.

For pharmacists situated in the interior,—especially in the districts

where sheepdips are used, and also for hospital purposes and disinfectants and deodorizers, etc.,—this is certainly highly desirable, because you can make up the official solution of cresol, if you get the cresol at such a low price, and not lose very much money on it when you sell it.

Chicago College of Pharmacy.

Mr. Beringer called attention to the requirements of the new Pharmacopœia in this connection, and particularly to its adoption of a preparation of linseed-oil soap. He said a careful distinction should be made between the two classes of preparations, the one that mixed with water and made a clear solution and that which made an emulsion-like mixture. He did not regard the preparation made with rosin soap particularly desirable for medicinal purposes, with its chances of decomposition, etc.

Mr. Wilbert said at the German Hospital, in Philadelphia, they had used preparations of this character for a great many years, and some fourteen or fifteen years ago they had hit upon a fairly soluble preparation which was free to anybody who cared to use it; they called it "Crysol." He thought the Pharmacopœia Committee had made a mistake in making such stringent requirements for cresol, for that which would correspond absolutely to the Pharmacopœial requirement could not be had for less than seventy-five cents a pound, which was entirely out of the question, This cresylic acid preparation was a very satisfactory product, and by the use of a rosin soap, a preparation could be had that would be cheap enough for anybody.

Mr. Cook, of Philadelphia, said his experience went to show that if the preparation was made exactly as the formula of the Pharmacopœia required, for a few hours afterward it exhibited a cloudy condition, apparently due to the fact that the saponification was not complete; but after standing some hours, a clear solution with water could be produced. If the manipulation was slightly modified, making the soft soap first, as the Pharmacopœia ordinarily makes it, and then adding the cresol, a preparation could be produced which would at once mix clear with water.

Mr. Wilbert said the saponified cresylic acid solution would not mix clear with hot water, and if the water contained sulphate of lime it would produce a milky solution, which was not due to the fact that the cresylic acid was not in solution, but because the lime was not in solution. This could be shown by using soft water instead of hard water.

Mr. Dunning thought almost any hydrant water would cause cloudiness, with the cresol dissolved by means of soft soap. Having made a preparation similar to this for use in the hospitals in Baltimore, they had found when hydrant water was used the preparation became cloudy on standing.

Mr. Hallberg said the proper thing to use was distilled water, and Mr. Wilbert said that was what they used in the German Hospital.

The Chair then gave Mr. Hynson an opportunity to exhibit two speci-

mens of a hair-tonic preparation, one of which became flocculent on shaking, and was not at all satisfactory, while the other was a smooth, milky mixture.

After some discussion regarding the two preparations submitted, which was participated in by Messrs. Alpers, Huested, Hynson, Dunning and Wilbert, on motion of Mr. Hynson, Mr. Dunning was requested to prepare a short paper embodying his experience in the matter for publication in the Proceedings. The following is the paper submitted :

A PHARMACEUTICAL DIFFICULTY.

BY H. A. BROWN DUNNING, OF BALTIMORE, MD.

Lead acetate	℥iv.
Precipitated sulphur	℥iv.
Ess. bergamot, 10 per cent.	℥iv.
Alcohol	℥ij.
Glycerin	℥iv.
Ammonia water	℥iv.
Tinct. cantharides	℥iv.
Dist. water, sufficient to make	℥xvj.

Having been requested by the Section on Practical Pharmacy and Dispensing, A. Ph. A., to present the discussion of this mixture in the form of a paper, the subject could, I think, be made quite interesting by laying before you the various ways this mixture was compounded and the reasons for so doing. The object was to obtain a homogeneous mixture, which, after separating, could be readily shaken up.

It was first put up by rubbing the sulphur to a smooth paste with the glycerin, then adding lead acerate, previously dissolved in water and ammonia water, and, finally the tincture of cantharides, alcohol and essence of bergamot, previously mixed. This procedure resulted in a mixture by no means homogeneous, but the sulphur was suspended in flocculi, part rising to the top and part settling to the bottom.

It was then mixed as follows : lead acetate, finely powdered, and sulphur were rubbed with the glycerin and the ammonia water added. After standing a short time, the water was added and, finally, the alcoholic solutions previously mixed. This last method was modified by mixing the alcoholic solutions and water, before adding to the other four ingredients.

Many other experiments were tried, as rubbing the lead acetate and sulphur with the alcoholic solution first, then adding the aqueous solution ; and, in my opinion, all conceivable ways of mixing, except one. The result was always flocculi of sulphur floating in the mixture. As the customer did not wish any suspending agent added, and did wish a smooth mixture, it was, using a slang phrase, "up to us."

It was learned that, primarily, the trouble was due to the essence of bergamot, more strictly speaking, the oil of bergamot, therein ; secondarily, to the tincture of cantharides.

I found, if the tincture of cantharides and essence of bergamot were

mixed with the alcohol and rubbed with precipitated calcium phosphate; all the other liquids added, excepting the ammonia water and glycerin; the mixture then filtered, the ammonia water and glycerin added; and, finally, the mixed liquids rubbed with the sulphur and lead acetate, a perfectly homogeneous mixture resulted.

The explanation is, that the excess of oil thrown out of solution from the essence of bergamot, by dilution with water, and also the resinous matter from the tincture of cantharides is grasped by the sulphur, as demonstrated by the fact that a perfectly clear solution is observed when the sulphur separates from the liquid portion. This causes the unsatisfactory mixture previously described, because the oil and small amount of resinous matter held by the sulphur, causes it to ball rather than to mix smoothly.

It is thought that this difficulty is rather unique, as probably a very few would at first suspect that the essence of bergamot or so small a quantity of tincture of cantharides would be the disturbing element in this mixture.

Mr. William Kaemmerer, of Columbus, O., was next invited by the Chair to explain some of the difficulties he had found with some twenty or more prescriptions that come to him in the regular course of business. Mr. Kaemmerer placed before the Section, in due order, some large blue-print copies of these prescriptions, and explained the various points upon which he desired an expression of opinion from the members. His presentation led to a long, informal discussion of the many points raised as he proceeded, participated in by Messrs. Hynson, Anderson, Beringer, Fisk, Dunning, Mayo, Hallberg, Cohn, Hays, Benfield, Alpers, Caspari, Scoville, Boring, Hopp, Whelpley and Lillie.

The text of Mr. Kaemmerer's paper here follows:

TWENTY PRESCRIPTIONS.

BY WM. F. KAEMMERER, PH. G.

The following prescriptions are offered with the hope that they will bring out points that will be of service to others, should they be called upon to compound prescriptions of a like character. No attempt has been made to classify them. I shall give them just in the order in which they were received. Some of them will bring out a few points not generally known. In one or two of them I wish to call attention to a few things which are sometimes overlooked, while with others I am not quite certain as to whether I did the proper thing in each case or not. Take prescription number one as an instance:

No. 1—

Ferrous sulphate	5 gr.
Magnesia	10 gr.
Peppermint water	11 fl. dr.
Spirit of nutmeg	1 fl. dr.

Mix.

Of such dose make one pint.

Directions—One teaspoonful twice a day.

This was a foreign prescription and I had to use my own judgment. I concluded that the writer had simply neglected or forgotten to write the word "sulphate" after the word magnesia, and this seems to have been the case, because the prescription was refilled several times and no complaint made. This prescription is also of interest because of the way it is written. The order to make of such dose, one pint is a little out of the ordinary method of writing a prescription.

No. 2—

Bromine ointment, ten per cent..... 1 oz.

Directions—Use as directed.

The base to be used is not stated. In order to make a satisfactory bromine ointment it is necessary to make a solution of bromine in water with the aid of some potassium bromide just as we do with iodine in making ointment of iodine where we use potassium iodide and water to dissolve the iodine. Only, in the case of bromine, it was found necessary to use considerable more water to dissolve the bromine. I prepared this ointment in the following manner: Into a small bottle I weighed one hundred and fifty grains of water and one hundred grains of potassium bromide and fifty grains of bromine. These were shaken together until the bromine and the potassium bromide were dissolved; two hundred grains of anhydrous lanolin were then placed in a mortar and the solution of bromine gradually added under constant stirring. The result was a very nice creamy ointment without any escaping fumes of bromine.

No. 3—

Calcium sulphide..... 15 gr.

Make into sixty pills.

I have found glucose to be the best excipient for making pills of calcium sulphide. The pills hold up well and are as small as those turned out by the different pharmaceutical houses. It is not necessary to add anything in order to give size to the pills.

No. 4—

Calomel..... 1 gr.

Urotropin..... 1 dr.

Mix. Divide into twelve powders.

Directions—One every four hours.

Calomel and urotropin are incompatible.

No. 5—

Potassium bicarbonate..... 3 dr.

Potassium citrate..... 1 oz.

Tincture of hyoscyamus..... 3 fl. dr.

Syrup of tolu, a sufficient quantity to make..... 3 fl. oz.

Mix.

Directions—Teaspoonful every two hours.

In compounding this prescription considerable effervescence takes place owing to the potassium citrate containing an excess of acid.

No. 6—

Sodium phosphate ..... 2½ oz.
Sodium bromide ..... ½ oz.
Mix.
Directions—Teaspoonful four times a day in water.

When sodium phosphate and sodium bromide are triturated together in a mortar, as in this prescription a pasty, semi-liquid mass results. Matters are helped somewhat if the two salts are lightly mixed on a piece of paper with a spatula.

If potassium bromide be used a more satisfactory mixture is obtained, the mixture becoming only slightly moist.

No. 7—

Gold bromide ..... 6 gr.
Water. ..... 6 fl. oz.
Make a solution.

If a small quantity of potassium bromide be added the solution takes on a bright and clear color. Without the bromide of potassium, although the gold bromide seems to be dissolved, the solution does not look bright and clear.

No. 8—

Bichloride of mercury ..... a sufficient quantity.
Vaseline ..... 2 dr.
One in ten thousand.

I used twelve minims of a one-in-a-thousand-minims solution of bichloride of mercury and enough vaseline to make two drachms.

No. 9—

Quinine sulphate ..... 3 dr.
Dilute sulphuric acid ..... sufficient to dissolve.
Sodium salicylate ..... 4 dr.
Extract of malt, a sufficient quantity to make ..... 12 fl. oz.
Directions—Teaspoonful three or four times a day.

In this case I omitted the acid entirely.

No. 10—

Ammonium iodide ..... 1 dr.
Apomorphine ..... 1 gr.
Dilute hydrochloric acid ..... 10 min.
Syrup of licorice ..... 1 fl. oz.
Peppermint water ..... 2 fl. oz.
Mix.
Directions—Teaspoonful every three or four hours.

Here again the acid was omitted entirely.

No. 11—

Salicylic acid	3 dr.
Potassium acetate	4 dr.
Glycerin	1 fl. oz.
Water.	4 fl. oz.

Mix.

Directions—A teaspoonful four times a day.

Quite contrary to what one would expect this makes a perfectly clear solution without any difficulty. This is not entirely due to the solvent action of the glycerin on the salicylic acid, but I am inclined to believe that the solution of alkali acetate have the power of dissolving considerable salicylic acid.

No. 12—

Salicylic acid	2 drs.
Solution of ammonium acetate	2 fl. oz.
Spirit of nitrous ether	½ fl. oz.
Syrup	½ fl. oz.

Mix.

Directions—Two teaspoonfuls every three hours until relieved.

In compounding this prescription the salicylic acid was mixed with the solution of ammonium acetate and filtered. To the filtrate I then added the spirit of nitrous ether and the syrup. Salicylic acid is incompatible with spirit of nitrous ether, but as no harmful compound is produced I think it was proper to dispense with this prescription. As the greater part of this salicylic acid was dissolved by the solution of ammonium acetate, I thought it best to filter the solution and dispense a clear preparation.

No. 13—

Potassium citrate	1 oz.
Ammonium benzoate	4 dr.
Water, a sufficient quantity to make	4 fl. oz.

Mix.

Directions—A teaspoonful every three hours.

This does not make a clear solution, as one would expect. I dispensed it with a "shake-well" label attached.

No. 14—

Morphine sulphate	3 gr.
Potassium cyanide	4 gr.
Aromatic sulphuric acid	2½ dr.
Syrup of wild cherry, a sufficient quantity to make	4 fl. oz.

Mix.

Directions—A teaspoonful three times a day.

This was dispensed without any harmful results following.

No. 15—

Magnesium sulphate	3 oz.
Aromatic sulphuric acid	2½ fl. dr.
Syrup, a sufficient quantity to make	8 fl. oz.

Mix.

Directions—Take a tablespoonful two or three times daily with water.

The magnesium sulphate was first dissolved in three fluidounces of water, the acid was added next, and then enough syrup added to make eight fluidounces.

No. 16—

Fluidextract of digitalis	1 fl. dr.

Put into twenty capsules.

Directions—One every three hours.

Magnesium carbonate was used to absorb the fluidextract of digitalis, and the mixture then made into a pill-mass with the aid of glycerite of tragacanth. This was then divided into twenty equal parts, and each enclosed in a capsule.

No. 17—

Creosotal	1½ fl. dr.
Basham's mixture	4 fl. oz.

Mix.

Directions—Two teaspoonfuls after each meal.

The creosotal was emulsified with the aid of one drachm of acacia and two drachms of water. The Basham's mixture was then gradually added to this emulsion.

No. 18—

Tincture of chloride of iron	1 fl. oz.
Dilute phosphoric acid	2 fl. oz.
Glycerin	2 fl. oz.
100 per cent. solution of sodium phosphate, a sufficient quantity to make	8 fl. oz.

Mix.

Directions—A teaspoonful in a half-glass of water after each meal.

This makes an unsatisfactory mixture, no matter how you prepare it. The most satisfactory mixture was obtained by shaking the glycerin and the solution of sodium phosphate in a bottle and gradually adding the dilute phosphoric acid previously mixed with the tincture of chloride of iron. This makes a creamy-looking mass.

No. 19—

Pyrophosphate of iron	2 dr.
Dilute phosphoric acid	3 fl. dr.
Syrup, a sufficient quantity to make	3 fl. oz.

Mix.

Directions—A teaspoonful in water an hour after meals.

Notwithstanding the fact that it has been preached for the last twenty years that the official dilute phosphoric acid is incompatible with solutions of phosphates of iron and pyrophosphate of iron, and that in cases of this kind we are to use the dilute metaphosphoric acid of the National Formulary, I feel satisfied that a great many druggists either forget about it or leave out the acid entirely whenever they get a prescription of this kind. I am led to this conclusion by the difficulty I had in finding some of the metaphosphoric acid.

No. 20—
Hyoscine hydrobromate..... ..... 2 gr.
Make into twenty-one pills.
Directions—One after each meal.

In cases of this kind I always add enough of some inert powder to make the pills weigh about one grain each. In this instance I used fifteen grains of powdered arrow-root and a little glucose as an excipient.

Mr. Boring moved that the paper be received, to take the usual course, and it was so ordered.

The Chair stated that, as the hour was late, it might be well to read the rest of the papers by title and refer them for publication, and this suggestion was adopted. Said papers here follow:

MY VADE-MECUM.

BY THOS. D. MCELHENIE.

The storing of the little things around a small, busy shop is quite a problem, and seldom done with any system or with a view to readily finding the thing wanted. After worrying along for a matter of twenty-five years and more, I contrived last summer an arrangement which might easily be copied in any store having a space say 2 feet wide and 7 feet high. The carpenter made for me an upright closet 7½ feet high, outside width 22⅝ inches, inside 20⅞, depth 6 inches, 15 shelves of ½-inch stuff—5½ inches apart in the clear. Procuring from my old friend Seabury about 75 of the winged tin boxes used for 100 mustard leaves, we improved the summer dullness in fitting these boxes, in alphabetical arrangement, with all the small vials of chemical extracts, powdered and soft, essential oils, etc., and the comfort and convenience of it is wonderful. Imagine wanting all at once ammonol, exalgini, mesotan, pepsin, urotropin, xeroform, etc., etc., and finding them all under your hand in five seconds. Any one in reach of my store who is interested is invited to come and see the outfit.

I had nearly forgotten to mention the door. It is like a trunk-lid, 3 inches deep, strongly hinged on, and has 10 shelves, on which are arranged alphabetically all the fluid extracts that are in 8-oz. vials or less, about 135 of them; another great comfort.

ON DRUG-STORE ECONOMICS.

I will wager a cookie that some of the men who have been pointing out ways to save expense around the shop, use a gas-stove to make their syrups. This is wicked waste. In my back shop is an old-fashioned, flat-top confectioner's stove, with concentric rings to allow various sizes of kettles. We do our various tasks requiring heat—burning up waste paper, hay, excelsior, broken boxes, etc. And we have established a scale of values. The daily gathering of waste paper, hay, excelsior, sawdust are the cheapest, as they have no selling value here. The next class having a slight value, as they can be sold for a trifle, are old newspapers, catalogues, etc. The next in value, involving a little labor, is broken boxes or other waste wood. The last is coal, and this costs money. We make a kettle of chocolate syrup about every other day, besides other cookery and heating, and very often do not even use wood, and have not used coal in a long time.

The very best and most wholesome thing for soda syrups to hold a foam is white of egg, using the white of four eggs to a two-gallon lot of syrup. My habit for many years has been to shake the whites in a bottle with a little water until disintegrated before straining into the syrup, but the transparent masses of albumen are hard to break up. I recently had a tinner carry out for me an idea that shortens the task. Taking two of the square screw-capped, half-pound tins used for Huyler's cocoa, I had the top cut off one and the bottom off the other, and the second one soldered on the top of the first with a diaphragm of wire cloth between, so that by putting in two or three ounces of water, dropping in the whites, and replacing the cap, a slight shaking up and down breaks up the albumen.

For years I have been in the habit of adding 5 per cent. glycerine to tincture iodine and tinct. ferri chlor. For the first it prevents the skin from getting hard and brittle and cracking, if a number of applications are made on the same spot. For the second, it prevents the crusting of the neck of the bottle with oxide, and makes it easier to clean.

BENZIN, NAPHTHA AND GASOLINE.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

Much confusion exists between these three terms. I have repeatedly sent to paint-stores and even drug-stores, asking for gasoline and received in place ordinary benzin. When I returned it, the buyer was told that it "was all the same." You can compare benzin, naphtha and gasoline to 94 per cent. alcohol, deodorized alcohol and absolute alcohol. If a customer asks for absolute alcohol you would not think of giving him 94 per cent. alcohol in place, but, the very same pharmacist dispenses benzin for gasoline. Of course he might make the argument, that gasoline is too explosive

and too highly inflammable and therefore too dangerous to use. The customer, however, ought to be told the facts and warned not to use it in a room in which a light is burning (best use it out of doors). Besides that a red danger label ought to be attached to the container.

Let us for a moment consider the difference between benzin, naphtha and gasoline.

When crude oil is subjected to fractional distillation, the very lightest hydrocarbons distill over first and are called gasoline. The next distillate of a heavier specific gravity is naphtha, and the next still heavier is benzin, and the last and heaviest is kerosene. The specific gravity of these liquids is ordinarily taken with a Baumé's hydrometer for liquids lighter than water, or what is called a coal-oil hydrometer.

It is graduated from 10° at bottom of the stem to 100° at top of the stem. The lighter the liquid specifically, the deeper will the coal-oil hydrometer sink in it. The instrument is adjusted for a temperature of 60° F. To correct the difference arising from a change of temperature you

Add 1° B. for every 10 degrees of temperature *below* 60° F., or on the other hand,

Subtract 1° B. for every 10 degrees of temperature *above* 60° F.

As I use a great deal of benzin, naphtha and gasoline in one branch of my business, I have thought over a simple method to distinguish these three hydrocarbons. I came to the following conclusion:

Hydrometer Indication 60—69° B. means Benzin, usually 62° B.
Hydrometer Indication 70—79° B. means Naphtha, usually 76° B.
Hydrometer Indication 80—89° B. means Gasoline, usually 86° B.

I hope that these figures will be of benefit to the profession, especially as the statements in nearly all the books are mixed up on the difference between benzin, naphtha and gasoline.

HOW TO KEEP FLAXSEED FREE FROM BUGS.

BY WM. MITTELBACH, Boonville, Mo.

As container use a tin can with a close-fitting top. At the bottom of the can place a small vial of chloroform with a loose-fitting cork stopper. Then pour the flaxseed, whole or ground, into can, covering the vial. Enough of the chloroform will escape from the vial to kill such insects as infest the flaxseed. If your flaxseed is fresh and free from insects when purchased, it will remain so, so long as your apply the preventive.

HOW TO KEEP READY PACKAGES FROM BEING OIL-STAINED AND SOILED.

BY WM. MITTELBACH, Boonville, Mo.

First wrap the substance in thin waxed paper, then cover it with your regular wrapping-paper—druggists' white parchment is the best for small packages—and label. In this way lycopodium, insect powder, ground

pepper, ground flaxseed and other oily substances can be kept in ready packages, and the cost of expensive cartons avoided. This gives your apprentice or clerk an opportunity to learn the fine art of putting up a neat package, in which act ye ancient drug clerk excelled our modern carton-handling pharmacist.

WOMEN IN PRACTICAL PHARMACY.

BY AMANDA W. STAHL AND CLARA M. MALARKEY.

Pharmacy may be divided into three parts, practical, theoretical, and commercial pharmacy. The theory of pharmacy may be found thoroughly exploited in all pharmaceutical works, or by those who have a thorough book understanding, if not a working method.

This contribution is to be founded entirely on a practical working knowledge of the practice of pharmacy, from the every-day routine of the drug-shop and the prescription counter. In the drug world to-day it is extremely hard to distinguish between the practical and the commercial views of the work, and in the close competition of prices, the methods must be considered as co-operative.

Many of our most successful drug merchants of to-day have only a practical education, but their training must have necessarily been under a most excellent preceptor, man or woman, and if this training is not obtainable, then we say that in addition to an ordinary apprenticeship, a college training is of paramount importance in preparing the pharmacist for the practical field of to-day. Most proprietors of to-day are too busy to give their clerks and apprentices the training necessary to qualify them for testing the purity of their chemicals and drugs, and these tests and reactions are thoroughly learned in the college training, thereby fitting the practical pharmacist doubly for all work that may reach him or her.

Women are very patient and persevering in detail work, which is absolutely necessary in preparing and dispensing medicines and drugs. This is shown in the greatest discovery of the age. We refer to the discovery of radium.

We invite you for a moment behind our ideal prescription case. Cleanliness above all things first, mortars, graduates, pill tiles and spatulas spotless, with the balance in a glass-enclosed case, and weighing grain for grain, and our poisonous drugs apart from the non-poisonous ones, in a place especially set apart for them, and said case clearly marked "poison."

See our bottles, not with dust around the corks, and not containing substitute or equivalent chemicals, but the chemical with its name on its bottle, and corresponding to the U. S. P. test when desired.

Next we take you to our fluidextracts, tinctures, wines, liquors and elixirs; they are made identically according to the Pharmacopœia and National Formulary in our own laboratory.

One of the greatest hindrances to the advancement of the drug work in

a commercial way, is that the doctors in very many localities do their own dispensing. This is due in a great measure to the failure of the pharmacist to acquaint the physician with his, the pharmacist's, ability to assist him, and also due to the fact that the druggist does not impress the fact on the physician's mind that his work is equal in every way to the work of the pharmaceutical houses, and almost all medicines for the cure of disease are to be found in the Pharmacopœia and National Formulary.

How many physicians know of these books? And aren't there a few druggists perhaps that do not know their value? For instance, one druggist we know of was handed a prescription for two ounces of detannated elixir of calisaya, and after reading it handed it back to the customer saying, "I haven't the detannated elixir in stock." Had he ever heard of the National Formulary? Think of the druggist losing the confidence of the customer, not saying anything about the loss of the commercial value.

If a woman pharmacist had been guilty of not knowing how to detannate an elixir, she would have been severely criticised for her ignorance and the customer would have said, she is a woman pharmacist; but it was a man.

By such happenings physicians have lost confidence in druggists, and naturally turn to the semi-proprietary medicines and pharmaceutical houses.

At this time it is opportune for the druggist to call the physician's attention to the new edition of the Pharmacopœia and its new remedies and various changes, thereby impressing the doctor with his, the druggist's, own efficiency, not only by theory but by inviting the doctor to inspect the new preparations made by himself; he can further gain the doctor's and customer's confidence by dispensing his medicines in neat, concise packages, liquids filtered when necessary, labels clearly written and neatly placed on the bottle, properly corked and capped, and the packages sealed. Capsules shining with the medicine on the *inside*, not one weighing three (3) and another five (5) grains.

We have often found this disadvantage in labels, that the druggist's name, place of business, and *brief biography* must be on the label, whether or not there is room left for the directions. Perhaps this sort of egotism is not general.

We find to-day that it is absolutely necessary to be polite and courteous to customers to hold their patronage, due to the fact that commercial and practical pharmacy are so inseparable. A man or woman must be able to sell the goods presented to the public. No matter how polite or courteous he may be, as a clerk we have found he is of no value to his employer if he can only dispense and not sell.

The writers of this paper have worked hard as women pharmacists, and yet they realize that there are some few women pharmacists not capable of holding all positions in drug stores. It is true, some men dislike to buy

certain medicines from women: is it not equally true that women who are the best patrons of drug stores, necessarily feel an embarrassment and timidity unless a woman pharmacist is within their reach.

Therefore, all you successful druggists, with your beautiful stores and seemingly perfect equipments for meeting the needs of patrons, take our advice and install a woman pharmacist, and then realize your loss for all these past years, and offer a delight to the better class of your customers, whose good opinion is of the greatest value to you.

PERMANENT OINTMENT OF RED MERCURIC OXIDE.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

No doubt many of us have been greatly annoyed by the instability of this ointment. We prepare a quantity, and in a few days or a week, when we have to use it, we find the upper part gray or even black and have to throw it away. In order to obtain information on this subject I sent in a query at the 1904 meeting (vide Proceedings p. 255): "How may Ung. Hydrarg. Oxid. Rubr. be prepared so it will keep a nice red color?" but it remained unanswered. So I started in to experiment myself, and I succeeded in October 1904 with the following formula:

Red Mercuric Oxide in very fine powder	10. Gm.
Castor Oil	5. Gm.
Yellow Vaseline	85. Gm.

Triturate the red mercuric oxide with the castor oil until a perfectly smooth mixture results, then gradually incorporate the yellow vaseline and mix thoroughly. For preparing ointment I use a glass mortar and pestle and a horn spatula. Never use a steel spatula as the iron will reduce the mercuric oxide to metallic mercury. Next put the ointment into the proper jar, smooth the top and cover with about one inch of water. Every time you have to use any ointment, with a horn or rubber spatula take it evenly off the top and smooth it out again. Never dig any holes into the ointment (by the way, I make that a point with all my ointments), or leave any ointment on top of the jar by wiping the spatula thereon.

It is not necessary to change the water. I have a jar of the ointment on hand which is almost a year old (prepared October 1904) and which has not changed in the least.

BORATED CASEIN MASSAGE.

BY J. F. DULANEY, McKINNEY, TEX.

Milk, skimmed	1000 Cc.
Sodium borate	65 Gm.
Sulphuric acid	20 Cc.
Sol. carmine	1 Cc.
Sp. bitter almond, 10 per cent. }	10 Cc.
Sp. neroli, 5 per cent. }	
Boric acid, q. s.	

Dissolve the sodium borate in the milk by aid of gentle heat, stirring. Set aside for twenty-four hours. Strain through muslin. In the solution dissolve boric acid to saturation. Strain. Add the solution of carmine and the sulphuric acid, gradually, stirring. Transfer to muslin strainer and wash well the precipitate with an aqueous saturated solution of boric acid. Express the excess of liquid and incorporate the spirits. Place in glass-stoppered bottles. Seal.

The yield of the above is about 400 Gm. The inexpensiveness of the preparation suggests itself to the pharmacist. It is neither greasy nor sticky. On massaging it gives the "rolling" effect, thus removing with it the dirt and black-heads accumulated in the pores. Being antiseptic, it is beneficial in some facial skin troubles, and is superseding the powder or paint of some ladies' toilet, giving a freshness to the complexion not imparted by the latter, notwithstanding the benefit to be derived by the massaging. The massage is also an indispensable article in all first-class barber shops. As it is used by both men and women, the druggist may create a wide range of sale for it.

The Chair announced the installation of officers as the next order of business, and appointed Mr. Hynson a committee of one to conduct Mr. William C. Alpers, of New York, the Chairman-elect, to the platform. Mr. Hynson performed this office, and introduced Mr. Alpers. Chairman Rapelye said in view of the late hour he would content himself with simply resigning the chair to Mr. Alpers, without attempting to make a speech. Mr. Alpers also begged to be excused from making an elaborate speech, for the same reason, and simply thanked the members for the honor conferred, and promised to do the best he could to keep the work of the Section up to the high mark at which his predecessors in office had brought it.

Mr. Alpers then took the chair.

Mr. Hynson next introduced Mr. H. A. B. Dunning, of Baltimore, as the new Secretary of the Section. The Chairman congratulated the gentleman upon his selection to this post, and expressed the hope that they might work together successfully during the coming year for the good of the Section. Mr. Dunning replied that he was very much pleased to be associated with a gentleman of the high character and ability of the Chairman, and expressed his thanks for the honor done him in his selection as Secretary.

Mr. W. O. Gross, of Fort Wayne, Ind., the new Associate on the Committee, was not present, and could not be formally installed.

The Chair called for miscellaneous business.

Mr. Hallberg moved a vote of thanks to the retiring officers for the arduous work they had accomplished during the year, and the motion was seconded by Mr. Benfield and carried.

On motion of Mr. Hallberg, the Section then adjourned.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST (AND ONLY) SESSION—THURSDAY AFTERNOON, SEPTEMBER 7, 1905.

The Section was called to order promptly at 3 p. m., by Chairman Charles R. Sherman, of Omaha.

In the absence of other members of the Committee on Commercial Interests, the Chairman called on Secretary R. C. Reilly, of St. Louis, to take the chair while he read his address.

Fellow Members: "We who are about to die greet you." It is with these words that the loyal, but doomed, ancients greeted their sovereign and fellow-countrymen before engaging in what was likely to be a fatal gladiatorial contest.

To those familiar with the "brief and fitful" career of this section, ending with its rough and well-nigh fatal handling by a co-ordinate branch of this Association at the Kansas City meeting, the quoted words above cannot seem inappropriate. But the Commercial Section to-day, notwithstanding the conditions to which, by hint, we have referred greets the members of this Association, "smiling and unafraid," and, if we may be pardoned, with faith in the use and utility of our existence.

It would be gratifying, indeed, I am sure, to all who are to-day engaged in the practice of pharmacy—if the art could be truthfully called a profession—and followed accordingly. I will not refer to the "Dictionary" definition of the word "profession," but surely no better one could be found for a professional man than that given by an architect friend with whom I recently conversed, viz., "One who puts the interest of his client ahead of his own," *e. g.*, the physician who takes the case, performs the operation, if a surgeon, and makes the necessary number of calls until recovery is assured; the lawyer defending his client to the end when once the case has been taken.

The patient and client in the respective instances receiving the full and complete benefit of the skill of his doctor and lawyer, because they are in honor and by custom bound to finish the case once undertaken, regardless of the chances of obtaining the usual fee.

On the other hand, the doctor, the lawyer or engineer may, when a busy or eminent man, exact for his professional services almost any fee that may seem proper to *himself* and within the limits of his client's means. Not so with the pharmacist, for the patient customer is apt to be rather "wise," and opines that Twelve 5-grain Phenacetin capsules is about the same as Acetparaphenetidin ℥i. Ft. Caps., No. xij., and refuses to pay any more for the latter than the former.

Time and place may govern the charge somewhat, but it is remarkable what little dif-

ference there is in the price of drug-store commodities, including the products of the prescription counter, from one end of the country to the other.

Churches, hospitals and colleges are founded and carry on their religious healing and educational work presumably without a domination of the commercial spirit. But the church has its treasurer or financial secretary, its "board of trustees," whose duties are not entirely of an ecclesiastical nature, and the personnel of which may include some "lay members." The hospital is almost never self-supporting and must include in its "corps" some one who can conserve and regulate its financial health, and supply regular and proper *fiscal* food and medication. The college, if it would be only moderately great, must have at its head a man of great "executive" and "administrative" ability —a man or woman of broad and deep learning and high ideals of course—*but* if he successfully guides the destiny of his institution, will he stand or sit with his ruler or textbook in hand? Will he spend his time in the laboratory or the study? Will he not rather peruse the catalogues and annual reports or announcements of rival institutions and keep his ease attuned to the spirit and trend of the hour?

All these institutions will, if almost universal precedent does not fail, through its proper officers, to keep itself in a decorously receptive attitude as regards a certain "*by-product*" of a large industrial institution, now commonly called "tainted money."

Some of these remarks may seem to have a pessimistic, flippant, or cynical ring, or to be otherwise out of place, but my plaint it this: the druggist is urged on the one hand to become a better qualified man technically (professionally, if you please) and to demand a better price for his services, and to be ethical. Good! but because he is technically qualified to do so, you must not expect or ask him to *produce* pharmaceuticals at a cost of $15.00 in his own time and material, that can be bought for $10.00 of the firm who is engaged in this class of business! And if he is foolish enough to do this, don't expect any considerable portion of the public are going to be willing to pay the increased ratio of price to him for these products.

On the other hand, throughout the length and breadth of the land the "druggist-as-he-is-found" is urged to be a better business man and taunted with the seeming fact that he is outstripped by his brother business men in the commercial race.

Right here, when the way seems the darkest and the proper road to choose most uncertain, all is made as clear as noonday, for I have before me three articles taken from current drug journals, any one of which should, it would seem, warn the druggist mariner from the rocks of commercialism, and guide him to the pleasant and safe waters of a professional career.

The first is entitled "The Ethics of Pharmacy," with the sub-headings, "A Scientific Vocation," "Ethics and Proper Conduct of Affairs," "Belief in the Potency of Drugs." Under this latter heading the author confesses that "it is very probable the belief in the potency of drugs is greater than their merits warrant." (This sounds almos as unkind as some of the things the profession say about some of the articles which we are censured for *handling* at all. Can it be possible that one by one the handling of certain drugs by the pharmacist will be interdicted by all or part of either the medical or pharmaceutical profession because the expected *result* is not always obtained.

"Stock the Pharmacist should Keep." Under this subheading we are told "that the pharmacist should only *keep* and *dispense* those remedies whose standards are fixed by the acknowledged authorities of his profession." I will not comment on this further than to say that were one to bring himself to the spirit of praying as to this, "Incline mine heart to keep this law," he would needs be "wise as a serpent and harmless as a dove" if he did not find himself even then the subject of criticism.

The last subheading in the good doctor's article is "Dangers of Commercialism," and here the pharmacist is offered the very sound warning that it is a reprehensible and *bad-paying* policy to reduce the price of an article, and the price then raised to a profitless

or money-losing basis with the hope that a trade may be established in this article and the price then raised to profit-bearing figure. (Good advice, indeed, Doctor Wiley, though a trifle commercial in its flavor). It isn't *safe* to "*bear*" prices too much, for when you are ready to raise them maybe the other fellow won't be.

Another late article on the burning question of this particular hour and moment comes from the virile pen of our fellow member and worker, and is captioned "Professionalism or Commercialism."

The first sub-heading is the "Commercial Man." The opening sentence under this head being the "commercial man has little to do with education," a sentiment we believe to be a little at variance with the best and latest commercial thought and spirit, as it is no uncommon occurrence for men to take thorough general, and later *special*, courses in universities with the end in view of becoming better dairymen or brewers.

The last piece of current literature bearing on the question under consideration which I shall mention, comes from the able, entertaining and versatile pen of that member of this Association who by speech and written word has done so much to create and maintain interest in the various sections of this Association, including the Commercial Section. Dr. Hynson's article, "*Ethical Pharmacy and its Recompense*," like the gentleman himself, is hopeful, helpful and entertaining. From a didactic standpoint no fault can be found with any of the rules he so pleasantly enunciates or the deductions he makes. He tells us pharmacy is or should be a profession, honorable, honored and lucrative—comparable with surgery in its relation to the medical profession; not an odoriferous trade —although somewhere else he complains with Father Doctor Ebert that the drug-store of to-day doesn't have the good old "drug-store odor" it used to have. (Honest now, Doctor Hynson, don't you think that odor, if it were really present to-day, would make that young lady you mentioned, waiting for the headache-medicine, sick.)

Under the sub-headings of "Pharmacy as a Special Branch," "Conduct in Business," "All Ethics on Same Foundation," "Observance of Laws," "Pharmacy of To-Day," Doctor Hynson shows us the pleasant pictures which he in his physical and mind's eye so clearly sees, till finally he reaches his journey's end, where evidently saving it for the last because the best (at least to most poor mortals) he tells us of "*the recompense*" and "*still* GREATER *recompense*."

Here he by "indirection seeks to find directions out," and gives a reflective glimpse of a model pharmacy which compounds about 50,000 ℞'s annually, maintains a firm of four members (and maintains them very comfortably, too, I guess, but the doctor didn't *say* this) and twenty contented employees. He didn't say so, but we suspect this store is in Baltimore, and that there isn't another one just like it there. If there was I'm afraid this firm would have to maintain less partners and less contented employees or widen its line of merchandise a bit.

Perhaps also Baltimore is a little different from any other city in the country. It is almost a certainty that no one present here to-day would care to shoulder the $40,000 a year drug-store lease recently made by some very competent pharmacists whom we know, and undertake to make the profit by running a store *entirely* along the line suggested by Dr. Hynson.

It may not be out of place to suggest before we leave the subject that there are several firms who compound close upon 100,000 prescriptions annually and do it with the garnishment of some horribly commercial surroundings. W. D. Howells, in making a few remarks as a preface to a lecture and to explain how both he and his writings were not wholly understood, at times, said that he met people frequently who up to that time had thought him an Englishman and *dead*.

We want no similar misunderstanding about the status of the drug-store of to-day. The foregoing remarks are, I am aware, a trifle irrelevant in many particulars, and no doubt seem little like what should be expected as a report or "address" of the Chair-

man of the Commercial Section of the A. Ph. A. But you have no doubt already noted that what I have said might be termed a few return shots fired from the rear of the Commercial army, the main body of which seems to be marching fearlessly and confidently on, most of them too busy with the brightening of their armor, refilling of their cartridge belts, knapsacks and canteens, to stop for a moment to study military science or witness sham battles. It is to be hoped that most of this army had the benefit of correct military training at the beginning of their career, and certainly that all recruits from now on will be obliged to spend the necessary time in studying tactics as well in the exercise of manual drill before being put in the field for actual service.

Personally, I would sound the note of hope and confidence as to the ultimate well being of the druggist and the drug fraternity. The prospects seem brighter to-day than ever before. Good commonsense laws in most of the States, prerequisite laws in others, together with the general spirit in the drug business as in all others, to do things better and bigger, have improved materially the condition of the druggist. I do not believe the commercial spirit will ever be less dominant. But abundance of this need not dwarf the proper growth and nurture of the mother art of pharmacy; indeed, the rule as to this as it meets your chairman's observation to-day is that the art of pharmacy has found its highest development, surrounded by some of the conditions that some of our friends would have us eliminate entirely.

I do not mean by this that I consider the soda fountain, the cigar-case, the wash-rag, or wash-soap counter necessary or inseparable adjuncts of the retail drug-store of to-day, but I do say that, as a man cannot swim the English Channel in his own bath-tub, let each individual consult his own personal inclinations and talents, his surroundings and opportunities, and direct his business accordingly, infract as few laws—divine or human—as possible, but finally each must sail his craft by the light of his own particular star.

A few lines from Joaquin Miller will, by substituting *drug-stores* for *men*, perhaps, round out my meaning more perfectly:

> "In men whom men condemn as ill
> I find so much of goodness still
> In men whom men pronounce divine,
> I find so much of sin and blot
> I do not dare to draw a line
> Between the two where God has not."

Mr. Eliel moved to receive the report just read and refer for publication, and Mr. Hynson, in seconding the motion, said he would have made this motion himself but for his "modesty and youth," but he had found the voice to say that he appreciated very much the lashing the Chairman had given him, and he would be even a better friend of Mr. Sherman's in the future than in the past.

Mr. Sherman resumed the chair.

The Chairman stated that there were no committee reports to make, and called for the reading of papers. He apologized for the lack of a printed programme, but said he had but little in the way of a precedent to go by; last year the Chairman was not present, and he had been pressed into service without warning, and they had gotten along very well in a go-as-you-please manner, and they could doubtless do it again.

Mr. Sherman said he had sent out a number of queries inviting papers upon the following subjects:

1. "Is there a tendency toward fewer and larger drug-stores, and if so, is this desirable?"

2. "Granting that it is necessary for the Pharmacist to handle ready-made medicines (Patents), should he become the manufacturer of them himself and make his store the *habitat*, or 'farm out' this business?"

3. "Can a dealer who ambitiously tries to become a merchant also hope to be known as a professional man?"

4. "Viewed from its Commercial bearing upon the drug business, is it desirable for those now in the business or who may desire to embark in it hereafter to have prerequisite laws enacted in the various states?"

5. "Is it not the Exceptional Case, when a drug-store of any size can exist on the business of Physicians' Prescriptions and sick-room merchandise alone?"

6. "Should the Commercial Section of the A. Ph. A. be abolished entirely or receive more attention from the members of the Association?"

7. "To what extent must the Pharmacist extend his Commercial Activities?"

The Chairman stated that by the last query he had hoped to elicit from the pharmacists of the country what lines could be handled without offending the physician or offending any one's sense of propriety, and along this line many of the papers had been formulated. He then called on Mr. Eberle, of Texas, to read a paper entitled, "Notes Anent the Drug Business," which he had prepared for the Section. Mr. Eberle explained that the paper had been written after he received the queries referred to, and this was an explanation of the title. He then read the following, receiving the applause of the members:

NOTES ANENT THE DRUG BUSINESS.

BY E. G. EBERLE, DALLAS, TEX.

Business competition has affected professions as well as trades. The drug business being *very perceptibly* of a commercial character, as well as professional, could not remain untouched. During the past week the officers of a medical association were cited to appear, having determined on a scale of fees to be charged for services rendered. Competition in professional circles must have been the cause. The preparations and articles used for the sick should be sold and dispensed by pharmacists only, in all other articles the druggist must expect competition from dealers in merchandise. A confectioner seemingly has as much right to sell soda water and candies, a tobacconist to sell cigars and cigarettes, a hair-dresser to sell combs and brushes, a stationer to sell papeterie, etc., as the druggist has to sell the various items of his stock that cannot be classed as drugs.

Through causes that it is not necessary to dwell on, other articles than drugs found their way into the drug-store, some to stay, others to be discarded. The average drug stock of to-day is composed of fully one-third which is unsalable. This includes as chief items, fixtures, apparatus and utensils; in other words, the salable portion of the stock must bear, aside from its own expense, at least the cost of interest, taxes, insurance, wear and tear of the unsalable. Of the salable stock a variable amount, according

to location, comes into direct competition with merchants, and is subject to the same trade regulations, for if these are disregarded their sale cannot be large. Of late years the same condition prevails to a greater or less extent with patent medicines and with articles sold direct to consumers by mail-order houses. A comparatively small portion, together with the prescription department, remains, on which a good profit can be expected, the latter has been cut on prescriptions by the necessary dispensing of proprietaries prescribed by the physician. These facts have caused certain druggists to increase their stock in an effort to augment the volume of sales, others to enter into partnership relations with other stores in order to decrease relative expenses and secure more favorable terms in their purchases, and perhaps a few to discard as much of the unprofitable stock, and devote more attention to the profitable. That still more decided changes will occur in the drug business is not only possible but probable, and for this reason the Commercial Section ought to find interesting work before it, for by direct interchange of ideas and intelligent discussions the conditions which may come about may be controlled and shaped for the benefit of the votary which would otherwise embarrass him. The changes will not be sudden, but be brought about through the development and progression which permeates the system at this time. In this connection the prerequisite requirements, the improved curriculum in colleges of pharmacy which should be followed by a weeding out of schools that do not join in the effort, the consideration of pure food and drug laws by the government and by states, the establishment of sections on therapeutics, materia medica and pharmacy in medical associations, the advanced ideas embodied in the new pharmacopœia, and the coming into greater favor of the National Formulary, may be cited as evidences. True, the non-conformation of drugs and their preparations, in a drug-store, to the pharmacopœia cuts little figure at the present time, but if this does not become compulsory it will mean that the druggist must not only be competent, but see that his drugs conform to the standard. Then will pharmacy be elevated and the number seeking this branch as a source of revenue from a small investment be materially decreased. It is unfortunate that the number of drug-stores which exist, and the continual additions precludes the possibility for a long time, at least, of establishing exclusive pharmacies, except in rare instances, the volume of business being too small, as a result of the numbers of those who compete, therefore the druggist must provide additional stock of another character to aid in the volume of sales and necessary profit. This being the case, the druggist willingly or unwillingly must adapt himself to the customs of a merchant, and he should, in goods of this character, give the best value, for the sales of this department act as an advertisement. In handling these goods it is an unwise policy not to make every effort to push the sales as do the better class of merchants. The restraints thrown around the medical practitioner do not

apply to the druggist. The efforts he puts forth will tell on his business in accordance with exertions in favor of the professional or commercial side, nor is it impossible to keep both divisions up to a high standard and on a paying basis. With regard to the sale of patent medicines, they cannot add to the reputation of the dealer; if there is sale for them, let him sell all he can, if he can procure an advertisement for his store let him secure it; but comment on the virtues of them is worse than useless; it is far better for him to make his own line of medicines from approved formulas and endeavor to further their sale through honest methods. It is wrong to sell your own in place of the medicine called for, but it is perfectly legitimate, if your remedy possesses merit, to resort to means which will create a demand for yours in place of that of other manufacturers. There can be no reasonable objection from a physician, for if you did not sell your own medicine, in most instances a patent medicine would be sold. The druggist has for too long time catered to the manufacturer of these preparations until he almost feels himself under obligations for the privilege granted him to sell their medicine; not only that, but they seek to step in and shape laws applying to pharmacy to conform to their interest. Instead, the favor is on the other side entirely. All they have done is to delude the public that each and every individual is at this moment in the very jaws of death, with a malady their remedy will cure. Let them relegate their medicines to the grocery or department store, or establish branches and see how long they will sustain the confidence of the public.

It can perhaps be safely stated that no store is making profit for the owner if the sale of merchandise does not annually exceed the capital invested, so that if the stock is increased the volume of sales must be greater. The average stock of drugs should be turned not less than five times a year to show a good healthy condition, and this can be accomplished only by close attention to all details and sustaining a proper relationship between the purchases made and goods sold. The combination of stores or the conducting of a number of stores is advantageous if the expenses are decreased for the same or greater volume of business or the bringing together of individuals, whose qualifications collectively are superior to individual effort. The objection to such combinations frequently is the loss of individuality, money interest becoming prominent and doing the voting. Fifty-one per cent. owned by one person may be more powerful than forty-nine per cent. owned by that many individuals. Sometimes it is well that such should be the case, more often otherwise.

The Chair invited discussion on the paper, but Mr. Hynson suggested that the other papers on this line be first presented, and then discussion be had on all of them, so as to save time. This suggestion was adopted.

The Chair then invited Mr. Hynson to read a short paper he had pre-

pared on Query No. 7. Mr. Hynson said he had requested the Chair to let him read his paper at this time, because he wanted to make an explanation. He said he did not want to pose in a false light; that he was a "rank commercialist," and did not desire to play the roll of an ethical pharmacist. He had sold both soda-water and cigars in his day, and it was not altogether because he wanted to elevate pharmacy that he gave them up; but his soda-water did not pay very well, and by cutting out cigars he had got rid of a lot of loafers. Then, when he had gotten that far on the road to ethical pharmacy, he thought he would go a little further and make some capital out of it. It was a matter of dollars and cents with him at last, and he did not want to be in the attitude of pretending otherwise. Mr. Hynson then told a good story to illustrate his position, gave warning against injurious or premature cutting-out of certain articles, and then read his paper as follows:

TO WHAT EXTENT MAY THE AVERAGE RETAIL PHARMACIST CARRY HIS COMMERCIAL ACTIVITIES WITHOUT OFFENDING MEDICAL MEN?

BY H. P. HYNSON.

This is, indeed, an important question, as the relationship between physician and pharmacist should be of the most amicable nature, and any reasonable sacrifice on the part of pharmacists that will bring about the better feeling should, in the opinion of the writer, be made. It does not appear, from my experience, that it is absolutely necessary to confine one's stock alone to those things which are used in the care of the sick, to secure the good will of physicians. The most objectionable articles that can be carried are the so-cal ed "patent medicines," and specifics that are put up by druggists themselves, for the treatment of various diseases.

Counter-prescribing, in any form, is objectionable to physicians, although a number do not object to druggists offering relief, in cases of emergency. In my opinion, a decided stand should be taken against this and nothing should be offered to customers. If they know what they want and ask for it, taking it upon their own responsibilities, there can be no objection to supplying simple remedies, providing there is no danger in the use of the article.

Although we have excluded toilet articles and soda-water from our store, we do not believe medical men object to these; in a great many instances they rather approve of their presence in drug-stores. Naturally, they and their patients greatly prefer a pharmacy that has a dignified appearance and in which are not displayed irrelevant things, especially patent medicine signs and advertisements of nostrums.

Mr. Hynson's paper was received with applause.

The Chair requested Mr. Mason, of Detroit, to read a paper on Query No. 3, by Mr. B. E. Pritchard, of McKeesport, Pa., in the absence of the

author. He said he was sure the members would agree with him that it was a most excellent paper, and one bearing most opportunely on this line of queries, "and this burning question of the hour." Mr. Mason presented the paper as follows:

ANSWER TO QUERY NO. 3.

BY B. E. PRITCHARD, McKEESPORT, PA.

I must confess to a thrill of personal pride in the fact that your Chairman has invited me to write a paper for this Commercial Section of that time-honored champion of the ethical side of pharmacy, the American Pharmaceutical Association. To me it comes as a revelation indicating in a pleasing manner that what efforts I have endeavored to put forth looking to the betterment of our vocation have at least been taken note of and have not been "as seed sown upon stony places."

I have been an interested, as well as an amused, reader of the stream of literature that has been flowing through the channels of the pharmaceutical press in the recent past, which had its beginning in the brain of our esteemed friend from Baltimore, and has for its theme the pregnant question "*Why are we not all Doctors?*" The whole symposium of papers reminded one strongly of that once familiar hymn we were wont to join harmoniously in singing, when as good little boys, we all attended Sunday-school:

"I want to be an angel, and with the angels stand"

when, to tell the truth, we did not then, nor do we now, want anything of the kind; why should we? In the immediate vicinity of my store there are more than a score of men whom we greet each time we meet them as doctor. It does not mean anything particular; the person so addressed may be either physician, dentist, chiropodist, veterinarian, preacher or teacher, but few of those who hear know which. My office is located in a modern "sky-scraper, thirteen stories high; on each floor there is an endless range of doors on which is to be found the word "doctor." It does not appear on my door, which stands as an oasis in the midst of tiresome monotony, and I confess to a feeling of gratitude sometimes that I have been spared, that my identity has not been swallowed up in the maelstrom, and I am permitted to utter the prayer of the Pharisee in the temple "I thank thee Lord that I am not as other men are."

Commercialism is not a crime; professionalism is not a beatitude; ability to combine both in one man is not an unattainable ambition, and is worth the attempt.

I was present at the golden anniversary of this Association in 1902. In the session the Commercial Section I recall having listened to one of the most interesting debates it has ever been my good fortune to hear, in the course of which two most distinguished members of our profession, both

prominently identified with this organization, inveighed bitterly against what at that time seemed to them to be "the influence for evil," that a young sister organization was bringing upon pharmacy by urging for a betterment of its commercial status. This discussion was the outcome of the reading of a paper on the above-mentioned view of the subject.

Time, we have been truly assured, works wonders. It is usually the unexpected that comes to pass. In December, 1904, just two years after the incident mentioned above, I was passing down upper Broadway, in New York, when my attention was arrested by the appearance of a most thoroughly pronounced type of a modern pharmacy; of course, I entered it. At the extreme rear, in a section of a right angle with the room, I found a perfectly equipped department for prescription work, with every evidence of the handiwork of one learned in his profession beyond the wont of ordinary men; I gazed in silent, profound admiration. Forward, spread out in all the lavishness and tempting array known only to an expert in his line, I found all the usual *side lines*.

Stepping up to the magnificent soda fountain, I called for a popular advertised beverage, which was served in the usual manner of the experienced soda dispenser. A check was handed me for an amount twice the customary charge, which indicated that the professional and commercial here lie down together, and I passed it into the hand of an attractive lady cashier, who received it, accompanied by a coin, which I noticed she did not handle with any evidence of suspicion that it was tainted money. The name of the proprietor of this trade emporium I need scarcely mention here; suffice it that since 1902 he had experienced an awakening. Did I leave that palace of professional commercialism, feeling that its owner was any the less a thoroughly reliable, well-grounded professional pharmacist than he had been before? No; certainly not. I realized that he had two talents, one of which he had previously neglected to cultivate.

In the vigorous activity that has been recently awakened in the drug trade throughout New England, I have at various times noted that the other speaker, on the occasion previously mentioned, is a member of the Boston Association of Retail Druggists, whose long experience makes his advice of great value to his fellows and he seems at all times ready to lend assistance. How true the words of the old saw, "Wise men will sometimes change their minds, but fools never."

If I might be permitted to do so I would move that the wording of Query No. 3 in the list of subjects submitted to this Section for discussion be amended so as to read: Can a dealer who has become known as a professional man hope to become a merchant also? for that is the mooted change that is rapidly forcing itself upon us. If the question was called on the proposition so worded I would surely vote "aye." To reach the goal, however, he would have put forth much greater effort than he has been accustomed to, which leads up to Query No. 7, "To what extent

may the pharmacist extend his commercial activities?" Answering this query, I would recommend that the extent should have no limitation other than to keep safely within his capital, and steer clear of such lines as would tend to lower his moral standing. At the same time he should never lose sight of his first love, the Department of Pharmacy, nor under any circumstance ever permit it to become subordinated.

Ever keep in mind that the public must not be led into the supposition that his spreading out into broader commercial lines has been because of his having made a failure of his professional side, but, on the contrary, let the latter keep pace with the new developments so that it may be rather said of him "Thou hast been faithful over a few things, I will make thee ruler over many things," which was the commendation of the master concerning those servants who had made a right use of the talents that had been entrusted to their care.

There ought not to be, in the mind of any right-thinking pharmacist, any incompatibility between properly balanced commercialism and professionalism. The two can be combined, but, I am free to say, not easily; to do so rightly will require thoughtful, discriminating care. Remember, in this connection the scriptural reference to the man who had failed to do his whole duty on one occasion; "This thou oughtest to have done and not to have left the other undone."

As Query No. 5 intimates, it is the exceptional case only where a drug-store can exist on purely ethical, within the limitations of pharmacy proper, business demands; therefore, it follows, that as it is imperative that pharmacy must be kept alive, it behooves each pharmacist to prepare for the inevitable. With all the conditions, as I have tried to place them before this body, would it not be extremely unwise that any thought be given in these deliberations looking to the suggested abolishment of this Commercial Section. On the contrary it should be given greater attention, its work entrusted to the care and oversight of the ablest and best qualified men in the ranks of the Association, to the end that instead of acknowledging that it has failed of its mission, it may become a powerful factor for good to those who put their trust in it. The men who need its fostering influence most can best be reached through this Section of this Association toward which they have for so many years looked for inspiration and guidance.

The Chair stated that he had mailed a list of queries to Mr. George H. Schafer, of Fort Madison, Iowa, well-known beacon-light of pharmacy in that Section, and he had simply written brief answers on the margin of the sheet sent him and mailed it back. Mr. Schafer had replied affirmatively to all the queries submitted, except No. 6. In the latter case he had answered "No" to the first half of the query referring to the abolishment of the Commercial Section, but "Yes" to the latter half of the query

advising more attention from members of the Association. Mr. Schafer furthermore advised that the 7th query "To what extent may the Pharmacist extend his Commercial Activities" be kept alive by the Commercial Section.

By invitation of the Chair, Mr. G. G. C. Simms, of Washington City, read the following paper touching upon all the queries proposed, receiving the applause of his audience:

THOUGHTS ON COMMERCIAL SUBJECTS.

BY G. G. C. SIMMS.

1. I do not think there is a tendency toward building fewer, but larger drug-stores in Washington, D. C., at this time. I think, however, that such a tendency *should exist*, as there are too many drug-stores already existing, most of them being small ones, having a very *limited supply* of medicines, and consequently unable to meet the demands of the community, forcing their would-be patrons to go to *larger stores* where they can have their wants attended to *promptly*. The people would be better served if there were less *smaller stores*, and *more larger ones*. As it is now the *messengers* of the *smaller stores* are continually running to the *larger ones* to get *supplies* for *immediate use*. The *larger stores* are *better supplied* with *pharmaceutical talent*, and physicians as well as the laity recognize this fact. I think the time is fast approaching when the tendency will be exhibited toward fewer stores.

2. The members of this Association, I am sure, have always been opposed to counter prescribing, therefore opposed to substituting their own preparations for patented articles, discarded. We sell patented remedies become the *public demand them*, and *will have them* even if they must go to grocery stores to get them. If we put up these remedies we will have to recommend them; and to do this will be equivalent to counter prescribing, and that is considered beneath the dignity of a pharmacist who depends upon physicians for his patronage. The pharmacist who embarks in the manufacture of a patent medicine and pushes the sale of it by advertising has no claim on the medical profession for their patronage; and certainly is unworthy of membership in this Association.

3. I do not think he can, and furthermore, I do not know why he should want to be so considered. A successful merchant occupies an enviable position in the community in which he lives, if he happens to be educated and respectable.

4. I think prerequisite laws should be enacted in all the states, and the District of Columbia, for all who propose to embark after this in the drug business, but I do not think that the examination of a candidate for the drug business should be more severe than that for entrance into a medical school. The people have a right to be protected against incompetent druggists, as well as against incompetent physicians. The candidates for

either profession should have, at least, a good high school education, or its equal.

5. *It is* exceptional when a drug-store can exist on the business of physicians' prescriptions and sick-room merchandise. Possibly 5 per cent. might exist in a city, containing one hundred thousand, or more of population.

6. If as much attention is given to commercial interests at the meeting which is to be held at Atlantic City this year, as has been given to meetings held in other places, I think the Commercial Section ought to be retained. If, however, the members loose all interest in the Section it would be well to abolish it. The N. A. R. D. can take care of the Commercial Section after they have settled the great question of prices which they have been wrestling with for several years.

7. I do not think the pharmacist needs to extend his commercial activities to much extent. If he wishes to be considered a professional man, he ought to curtail his business as a merchant, and let hardware, groceries and other merchandise go where they belong. If he wants to become a better merchant let him extend his business in that line, and buy and sell drugs as he would merchandise.

A paper on the third query, by Mr. S. L. Caine, of Columbus, Miss., was, in the absence of the author, read by title and referred:

REPLY TO QUERIES OF THE SECTION ON COMMERCIAL INTERESTS.

BY S. L. CAINE, COLUMBUS, MISS.

Each of the subjects presented is of such vital importance, one scarcely knows where to begin.

But the third subject—"can a dealer who ambitiously tries to become a merchant also hope to be known as a professional man?" admits of much argument in the negative.

We look about us among the various professions of the day, to see a vast number of men engaged in other pursuits (professional) and find them to be wealthy; having gained from their profession alone. Among these might be sighted the lawyer as a typical example. He exercises his skill and learning to his own advantage without being necessarily exorbitant in his charges for services rendered. It sometimes becomes a "life and death matter" left in his hands, and any price would not be too great for his knowledge. Looking at the thousand cases brought to the pharmacist, as a "life and death" matter, as it may be, how many of your customers would complain of an overcharge, or go to some other store for prices, were you to charge according to services rendered? When the real test comes to those patrons of yours, you will find they want *only the best*, and *that* finally handed them by some one who *knows that he knows* what he is doing. Furthermore, they are willing to pay for it.

These days, there are few, if any, who after remaining in the active practice of pharmacy during a lifetime, accumulate what might be termed a snug fortune. We sometimes find a man who has grown wealthy, and who was formerly a pharmacist, but upon closer investigation you will also find, that only his *start* was made "rolling pills."

The situation therefore resolves itself into section four as a remedy—"Pre-requisite laws in each state to govern the drug business as a profession." Our best colleges have taken the initiative in this matter, by requiring a standard of knowledge which must be gained in public schools before being permitted to enter. This will, eventually, put every avenue to the prescription counter on a higher plane, thus barring many a so-called compounder from dosing out articles, *presumably* according to the doctor's prescription.

It is gratifying to note the rapid advance taken by some of the states towards higher education. The states of New York, Pennsylvania, and the pharmaceutical boards of Wisconsin, Ohio and Indiana, each having adopted college requirements of candidates for examination, while the colleges are raising their standards or curriculums, is evidence of progress. It follows, then, that our examining boards can finally adopt such measures as to insure the safety of the doctor's prescription, also the health of the people, and incidentally exact the real value of knowledge and experience from the public.

The present condition of the drug business, generally speaking, is such, that were a man to attempt to rely on the physician's prescriptions and sick-room merchandise alone for a living, I am inclined to believe that man's time would be wasted. He is therefore compelled to resort to side-lines. I can see no reason for his not handling such articles as do not encroach upon some specific line of merchandise. He can hardly be expected to handle such as hardware, furniture, crockery, dry goods or shoes, but the public expects to find such as cigars, soda water, candies, perfumes and stationery at what is popularly known as an up-to-date drug-store. It is upon these lines only, he can make a comfortable living. While I should like to see *real pharmacies* throughout the country, yet so long as the number of stores remain as are found at almost every corner in our cities, we must handle these side-lines. There is nothing like being wide awake.

This proposition holds true, not alone of the druggist who should advertise his wares in some way, but of our association work as well. I was "struck" with the determination, or wide-awake feeling, of the legislative committee of the Georgia Pharmaceutical Association, when they decided to appeal to all Georgia pharmacists for a contribution to aid in prosecuting all violators of their state pharmacy laws,—the state government have failed to provide funds for this contigency. No doubt, all of us feel the effects of dishonest competition. When certain manufacturers place on

the market such household articles as laudanum, paregoric, castor-oil spirit camphor etc., which do not conform to pharmacopœial strength, and at prices far less than cost of standard production, such competition should be stopped through the enactment and enforcement of laws.

These seven subjects should be discussed at each meeting of our state association. We can always find a man who has learned something from his individual experience, which escaped our attention altogether. I do not believe it should be our sole ambition to make money only, but a comfortable living, along with a surplus set aside each year, to take care of us and ours, during years of old age or disability, certainly adds much to the vigor of toil during the youthful years of a pharmacist's career.

The American Pharmaceutical Association has done its part towards eliminating many of the evils ; it has affiliated itself with the principals of the N. A. R. D. to such an extent as to avoid price-cutting in many parts of our country ; it has added dignity to the profession which has drawn the attention of the nation ; it has produced a code of honor, to which every druggist in the United States owes a debt of allegiance. Each member of the profession should arrange to add his name to its membership, and attend each annual meeting, where he may gain knowledge, and if he has any ideas—exchange them with his fellow craftsmen.

Mr. Anthony Fly, of McComb City, Miss., then read the following paper on query No. 7 :

"IN THE PRACTICE OF PHARMACY, IS COMMERCIALISM JUSTIFIABLE?"

BY ANTHONY FLY.

The practice of pharmacy as we have it to-day is from necessity divided into two parts or classes, viz., the commercial and the scientific. They assume the proportions toward each other as do the component parts of matter as we find them in nature, be they material or immaterial, the one dependent upon the other by him who makes a success of his calling.

The man who is destined to advance the science of the practice of pharmacy must forever abandon the idea of making money (using a commonplace expression). The question at once arises, Why? In my humble opinion one to secure the best results in the development of a science, whether it be astronomy, geology, electricity, or what not, must not be hampered with the burning question of having to earn a livelihood. Some of the most scientific men the world has ever known have spurned the idea of riches, which were easily within their grasp, for the reason that the all-wise Providence did not make man with such a broad expanse of wisdom as to let him at one hour be diving into the mysteries of the unknown world and the next be bartering a piece of commodity, that he might be filled with food and be covered with raiment.

Commercialism has so gradually crept into the practice of pharmacy

until to-day it seems to be one of its most vital functions. You might ask, Has not this been the choice of the man who had adopted this profession? In a measure I suppose it has. Not altogether his choosing, either. In this connection I should be pleased to ask every member of the A. Ph. A. who is familiar with the dispensing part of his business how the U. S. P and National Formulary products compare with the "proprietaries" or specialties which he dispenses?

I do not wish to be misunderstood as so cowardly as to place upon the shoulders of some others the responsibility for the retrograding of the science of pharmacy as it should appear in every-day life. Let the fault rest where it may, it is a foregone conclusion, however, that it is not because the pharmacist of America to-day is not qualified to manufacture these adopted formulas, recognized by the world as the standard, except by those who dominate the "unscrupulous" druggist and are gulled by literature issued by skilled men commercially in the manufacture of these high-class specialties.

The By-laws and Constitution of the A. Ph. A. are so broad in their entirety as to receive men from different callings pertaining to the practice of pharmacy: teachers, chemists and tradesman. I take it that the prerogative of those who belong to the first two classes mentioned, is to enter into experimental analyses making the more intricate researches for the development of this noble Profession, and for the other classes to profit thereby, keeping as near apace with their brothers as the pursuit of their daily avocations will allow; being ready at all times to respond to the support of those who by their untiring efforts are advancing the cause scientifically, by patronizing such institutions and using every energy they possess to encourage those whom they control and with whom they come in contact to aspire to accumulate knowlege. There is nothing that elevates a nation, a community, or a specific class of men like education. In my opinion the grandest move toward the upward growth of our Profession is *Education*.

Question No. 7 asked by the committee on commercial interests, says, "To what extent may the pharmacist extend his commercial activities? I take it that this applies to the drug-store pharmacist as well as to the man who has the degree of Ph. G. attached to his name and who may be engaged as a chemist or a teacher in some school of pharmacy. If I am correct in my assumption it is my opinion that the more aggressive in a high-toned way the active pharmacist is in the way of presenting himself and his business to the world the more successful he is. The pharmacy of to-day is not simply a dispensary where the needs of mankind are supplied for the prolonging of life or the restoration of health. On the other hand, the pharmacist who would gladly pursue that end of his work which his hours of study or years of experience have fitted him for, is from necessity compelled to be a merchant. He has the strongest competition along

some lines, for the department stores and the jobbing retailer have made such inroads upon his profits by using a large number of his most staple articles as leaders.

These staples, my brother, I consider more responsible for the retarding of the professional and scientific side of the every-day pharmacist than almost any other particular cause. The question is not asked the pharmacist, "Will you handle our products?" but it has been the policy of these manufacturers for years to say to the dealers, "You must handle our products, we will force you into this by printer's ink." The determination which these manufacturers put into their business has step by step pushed the would-be scientific man into the shade, until to-day it is not how well qualified is a man for the pursuit of his profession, but how good is he as a salesman, a window-dresser, a soda-jerker, etc., etc.

These facts we all know are the existing state of affairs. I therefore claim that from necessity it behooves the pharmacist of to-day to exert all the commercial activity, which the Good Lord will supply him in the maintenance of his business.

A paper by Mr. J. M. Alexander, of Tchula, Miss., on query No. 7, was, in the absence of the writer, read by title and referred for publication:

TO WHAT EXTENT MAY THE PHARMACIST EXTEND HIS COMMERCIAL ACTIVITIES.

BY J. M. ALEXANDER.

I believe this is a subject that ought to interest every pharmacist; yet many do not seem to be concerned but sit down and let things come as they will. To make the most money out of his business the pharmacist must be busy and keep his clerks busy, for most assuredly his expense is going on whether he works or plays. Something must be done to offset this expense, business must be increased and expense diminished to make a success. Clerk hire, rent, insurance, light, heat, all cost money and must be provided whether business is good or not. To overcome this leakage the pharmacist must have his wits about him. If others can make money out of this business why cannot he? If others can put up their own preparations why cannot he? Oftimes his clerks will stand waiting for business when their time could be better occupied putting up something that he would be compelled to buy in the market in a very few days to supply his trade. If anyone else can put up a diarrhœa cordial, a good liniment or antiseptic, a toilet preparation such as cold cream, camphor ice, cosmetique, talcum powder, toilet water and a hundred and one different articles there are calls for every day—he can manufacture these things at little cost with his same clerk hire, same rent, insurance, light, etc., and save the middleman's profit and give his customers something that will do the patient good and build up a name for his preparations that

might bring him a handsome income some sweet day in the near future. At the same time he teaches and prepares his clerks to make a pharmacist who does not have to rely altogether on prescription business for a livelihood.

A pharmacist need not say that he is not skilled in the art of putting-up such preparations, for most any one has a few good formulas, and if he is unfortunate enough not to have any that he could rely upon, let him get a copy of the many good formularies, such as the "Standard Formulary," and he will find most anything he wants. He can buy bottles cheap at Louisville, Ky., labels and cartons from various printing houses, and most any one can put on labels and cartons so as to be presentable. Therefore, I can not see why everybody can not put up his own preparations. If a pharmacist depends upon a physician for his prescriptions he will get left. Most small towns have drug-stores run by M. D.'s, which I think ought to be legislated against. An M. D. ought to practice medicine and a pharmacist prepare and sell medicine. There are some M. D.'s who write a few prescriptions who expect the pharmacist to introduce every customer that comes into his store. If the customer happens to have bowel trouble and asks for some diarrhœa cordial, the pharmacist is expected to introduce the patient to the M. D. A prescription is written, for which the M. D. demands $1.00 cash. When the medicine has been put up, the pharmacist asks 50 cents for the medicine and much work; he is invariably informed that the doctor has all his money. The result is the medicine must be charged, and take the chances of never getting your money or seeing the patient again. Of course the M. D. does not care. He will smile and say "I got mine." On the other hand, if you had taken down one of your own preparations and sold him at 25 cents or 50 cents, you would have gotten cash money and made a nice profit, and your customer would have been pleased and come back to your store for something else in preference to paying a physician to prescribe for him. Then you have to give the M. D.'s such privileges about your store; some of them are not very careful as to how many cigars they smoke for you; an office has to be furnished, emergency bags filled, everything sold to him at cost, and will some one please tell me what profit there is in business run that way.

"Commercial activities," why there are lots of them if you look around for them and stir them up. The pharmacist can get in line by joining the A. Ph. A. and sustaining his State Ph. A. This is the only way he can get representation. If he does not help some, how can he expect others to fight his cause? I figure that out of a $20,000 business last year 50 per cent. of the real drug sales were my own preparations, at a profit of not less than 50 per cent. It is only in exceptional cases that a drug-store can exist on physicians' prescriptions, especially when two or more physicians of the town are connected with a drug-store. Put your clerks to work and make them earn their wages.

Mr. Hynson now moved that discussion of the various queries proposed, with the papers presented in connection with them, be taken up *seriatim*.

Mr. Seabury moved to amend to the effect that no member speak more than five minutes.

The motion as amended was put and carried, and the Chair called for discussion on Query No. 1, "Is there a tendency toward fewer and larger drug-stores? and if so, is this desirable?"

Mr. Eliel took the position that there was such a tendency, in the larger cities especially, and said that while that condition would tend to drive out the smaller stores, just as the smaller traders and dealers had been driven out by the department stores, there was no doubt the public vastly benefited thereby, because the larger store had a better equipment and higher grade of assistants, and was always enabled to carry a more complete stock of goods.

No remarks were offered on Query No. 2, as to the handling of patent medicines.

Discussion was called for on Query No. 3, "Can a dealer who ambitiously tries to become a merchant also hope to be known as a professional man?"

Mr. Alpers opened the discussion on this query, and repudiated the idea that the professional pharmacist was necessarily an idealist or visionary, who paid no thought to money-making and believed he could live on air. The pharmacist is like the physician and the lawyer, who do not practice their professions for the love of them alone, but to make a living out of them; and the pharmacist who sets himself up as a professional man does so, to some extent at least, because he believes it pays better, and he thought it was a fact that professional pharmacists, as a rule, made more money and got along better than the merely commercial pharmacist. He spoke of the fact that in New York and Chicago some of the department stores have even gone so far as to install regular registered pharmacists; but he did not believe the physicians would ever desire to have their prescriptions go to a department store to be filled, and declared his belief that a well-established professional pharmacy would always remain a necessity in every civilized community.

Replying to Mr. Pritchard's reference in his paper to the evolution of a highly-professional pharmacy on Broadway into a happy combination of professionalism and commercialism, Mr. Alpers explained that he had not found it practical to cut out everything, even in a highly-professional pharmacy. Your physician wants you to keep a certain tooth-brush, for instance, or a certain perfume, because he likes to order it; he has certain patients who wish to have perfumes added to their liniments. Soaps, too, are largely used for medical purposes. The line is hard to draw, and the pharmacist cannot get around keeping some articles of this sort, no matter how professional he is. But the idea is, that professionalism must

be the basal principle with every pharmacist, in order to be successful, and the qualified man who lives up to that ideal will be more successful than the man who believes in commercialism as the only salvation of pharmacy. The tide is already changing. Two or three years ago, papers read before State Associations—and even before this Association—advocating the throwing of professionalism to the winds and standing for commercialism, pure and simple, went unchallenged; but it is not so to-day, and those who had the courage to protest against the spirit of commercialism then are now looked upon in a different light. "Retain in your pharmacy always," said Mr. Alpers, "the aspect and dignity of a professional pharmacist, and not only will the physician patronize you, but the public will surely appreciate your efforts."

Mr. Hallberg said the professional pharmacist needed to be "an emulsion." "He must be a homogeneous mixture of two articles more or less incompatible." If he can present such a condition, he will succeed. He congratulated Mr. Alpers upon the elimination of chairs and tables in the sale of soda-water, and declared that "nothing riled his pharmaceutical cuticle" so much as such a spectacle in a drug store.

Mr. Eliel stated that he, also, had attempted to conduct a professional pharmacy, but he had traveled a hard and rocky road in the attempt to put it on a paying basis in a city of less than a hundred thousand inhabitants (South Bend, Ind.), and if it had not been for the good fortune that favored him "in connection with an epidemic" he would not have succeeded. He started his establishment without proprietary articles, without soda-water, without cigars, and with only such drug sundries as were especially required for the sick-room and nursery, and with the ordinary toilet articles. He had found, however, that it was a great saving of time to add a few proprietary articles; it was easier to hand them out than to explain why he did not keep them. And so it was with cigars and a small line of stationery, that he kept for the accommodation of his customers. He doubted whether simon-pure professional pharmacy could be made a success, except in the larger cities.

Mr. Stewart suggested that it would be interesting to hear from Mr. N. H. Martin as to how the business was carried on in England.

Mr. Martin said this particular subject interested him very much, because he was one of those who maintained that pharmacy was a profession, and must be conducted on a professional basis; but he saw no reason whatever why the pharmacist should not be an excellent business man at the same time, and he endorsed cordially all Mr. Alpers had said. He thought for a man to be known as a pharmacist would not only contribute to the success of his business as such, but would help his business in other legitimate lines as well. Mr. Martin told how he had always discouraged the proprietary-medicine business by refusing to stand for the merits of these preparations as claimed by the makers, and telling the customer that

he knew as much about them as he did himself, since he was ignorant of their contents. If the pharmacist had refused to allow his name to be used to boost these proprietary articles, they would not have one-tenth the vogue they have to-day. Millions had been spent in advertising one little pill, and it was a disgrace to pharmacy and medicine that such a thing should exist. Mr. Martin then proceeded to read from an advertisement that he held in his hand of a so-called consumption cure, as showing the exaggerated claims of these people, and wound up by declaring that while the pharmacist could not prevent the public from buying what they wanted, he could prevent the use of his name in connection with unscientific preparations.

The Chair called for discussion on Query No. 4, as to the desirability of pre-requisite laws in the various States.

Mr. Alpers said he supposed the Association had answered that question by endorsing the pre-requisite law presented by Mr. Beal before the Section on Education and Legislation. Mr. Mayo said he did not so understand, and thought this was a different question.

Mr. Ebert declared himself in favor of such laws, as tending to lessen the number of drug-stores. It would require higher qualifications in the pharmacist, but would not require the clerk to pass the examination of a registered pharmacist in order to be a clerk. The law should set a higher qualification for the registered pharmacist, and previous to becoming such the clerk should be allowed to go from one end of the country to the other without re-examination, upon his certificate of examination in the first place; but when he comes up for examination as a registered pharmacist, then he should be rigidly examined before the Board of Pharmacy. He was opposed—and had been for twenty-five years—to the turning-loose by the State Boards, annually, of an army of young men as registered pharmacists, many of whom would set up at once and become competitors of the older pharmacists in business.

Mr. Hopp stated that the Ohio State Association, at its last meeting, had adopted an amendment, to be presented to the Legislature at its coming session next winter, to permit the pharmacist examined in another State to come to Ohio and practice as an assistant pharmacist without re-examination; then if he wants to become a registered pharmacist, he can come up for examination as all other registered pharmacists have to do. He said he had brought this question up five years ago, but at that time his was the only vote in favor of it.

Mr. Clay W. Holmes, of Elmira, N. Y., was emphatically in favor of pre-requisite laws, as without them he failed to see how pharmacy could be advanced as a profession. Anything which could be done to educate the pharmacist would so much the better prepare him to conduct a commercial pharmacy on professional lines.

There was no discussion on the fifth query.

The Chair read the sixth query, as to whether the Commercial Section should be abolished, or receive more attention from the members.

Mr. Seabury, to the first part of the query, as to whether the Section should be abolished, entered an emphatic No. He was equally emphatic in answering the latter part of the query, as to whether the members should take more interest in it, in the affirmative. Mr. Seabury went somewhat into the history of the Section, and called attention to the fulfillment of some prophecies made by him ten years ago, when he was chairman.

Mr. Hynson stated that, in order to get something of value out of this discussion, he would like to offer the following:

Resolved, That it is the sense of this Section now in session that in the interest and for the welfare of the larger number of pharmacists the Section should be continued, and have the earnest support of the Association and other Sections.

This resolution was seconded by Mr. Carter, of Indianapolis.

Mr. Mason expressed the opinion that it was very evident that commercialism was a very important factor in pharmacy as practiced to-day, and he believed it would be a grave mistake to abolish this section. He thought there had been too much academic discussion in the Section, however, and that it should rather constitute itself into a sort of post-graduate school of business practice, with papers on practical problems like window-dressing, advertising by circular, and other advertising propaganda of that sort that had proven successful.

Mr. Carter also expressed himself as opposed to the abolishment of the Section.

Mr. Ebert thought the Section on Practical Pharmacy and Dispensing had done away, in a large measure, with the usefulness of the Commercial Section, and suggested a combination of the two.

Mr. Eliel recalled some notable meetings of the Commercial Section in the past, particularly the meeting of 1898, in Baltimore, when Mr. Jacobs, of Atlanta, was chairman. He proposed as a practical subject to take up that of acids in respect to their designation by the wholesale houses by number or otherwise than percentage strength. He gave some illustrations of the inconvenience resulting from this practice.

A vote was then had on Mr. Hynson's resolution, and it carried.

In connection with the resolution just passed, Mr. Seabury offered the following:

Resolved, That the Secretary of the Section be instructed to invite all State Pharmaceutical Associations' Committee on Trade and Commercial Interests, to attend their annual meetings, and take part in their deliberations.

The motion was seconded by Mr. Hynson and carried.

The Chair read again Query No. 7, and said that while the other papers on this query had been read, he had purposely saved one by Mr. Ra-

pelye on this subject, and would ask him to read it at this time. Mr. Rapelye then read the following:

TO WHAT EXTENT MAY THE PHARMACIST EMPLOY COMMERCIAL METHODS.

BY CHAS. A. RAPELYE, HARTFORD, CONN.

The modern drug store is complex in its stock, its management, and its being. Influenced by its surroundings, conditions and patrons, it takes on varying shades of commercialism until in some cases it almost ceases to be a drug store except in name.

In taking up the discussion of the status of the present-day drug store, the question will involve consideration from two distinct standpoints: First, can the strictly professional store exist except in the few larger cities? Experience has proven that it cannot, the public having not as yet become alive to the fact that pharmacy is a profession, and are not ready to accept the professional store seriously. Whenever the experiment has been tried it has usually resulted in failure. Whether their views will change is a question for the future to decide, and in what manner it is decided lies largely with us. If, however, the steady multiplication of stores is to continue there can be but one solution of the question, and that is the continuance of present conditions. In a general sense the question is further complicated by the commercial attitude of the physicians, who are by their habit of dispensing helping to destroy much of our professional standing.

Having clearly demonstrated the practical impossibility of the successful maintenance of the professional store, we arrive at the second question: What shall be done regarding commercial methods in the stores as at present conducted?

Pharmacy having two well-defined sides—the professional and the commercial—it requires much thought and study to so guide the store that both shall have ample consideration and wise treatment. The commercial tendencies of to-day strongly press one to yield to his commercial instincts, but as all pharmacists cling with some tenacity to the foundation of their calling, their first and strongest impulse is to protect in great measure the professional side, even though they may have the inclination toward the commercial, and desire to give it more or less prominence.

Opinions differ as to the commercial methods which may be employed, as indeed they must, widely-varying conditions having much to do in determining the best means to be used to influence trade, location is perhaps the most important factor in the situation, while many other questions demand consideration, and all must have careful attention before a specific plan can be adopted.

Whether he be commercially active or passive the pharmacist must encounter more or less criticism, on the one hand being accused of being over-active, on the other of being slow and not a good merchant. Being

active he is quite likely to excite the criticism of the physician and the more conservative public, who seem to feel that the same energy and push, which if put into other lines of business would meet with their approval, is beneath the dignity of the pharmacist. This phase of the matter will no doubt have more liberal consideration in the near future, as the rapid growth of the commercial spirit will compel a different view. If content to plod he then arouses criticism and is accused of being behind the times, even though he may defend himself from such a charge by taking refuge in the professional character of his business, and that course he believes to be the correct one, as the plodder is not by nature a merchant, and cannot overcome the old idea that business activity is not necessary to the pharmacist. He does not realize that he is living in a busy world, and is, therefore, content to struggle along old lines, without giving much thought to the increase of business, being seemingly devoid of that push and energy which make for success in all fields of work.

These two classes are not uncommon in pharmacy, as a wide divergence of opinion exists as to how far modern commercial methods shall be employed; but a contention that no active efforts should be made to secure the patronage of the public would be opposed by the large majority, and would obviously provoke wide discussion.

Pure pharmacy is making rapid strides forward, but the attitude of the physicians regarding proprietaries is such that the pharmacist has little opportunity to demonstrate his ability, unless he takes up, as he should, the production of like preparations, but in almost all cities the dispensing department shows a diminishing business.

It is not therefore surprising that pharmacists have turned their attention to commercial matters, and as competition has come in large measure and on various lines, from sources outside of pharmacy, he is pushed on all sides towards measures which will to some extent at least tend to overcome adverse conditions.

In the employment of means to the end each must be a law unto himself and the store will vary in its management according to the individual leaning of its owner, who will work out his problem according to his own view-point and surroundings, working along lines that yield the best results.

The ability to so adjust his business that commercial methods shall be forceful and yet not given so great prominence as to hide the professional side, which he desires to retain and make secure his standing as a pharmacist, and giving to the store such management as to allow him to secure all that can be had from both sides, is the true secret of success in pharmacy under modern conditions.

The Chair stated that it was scarcely necessary to move the formal adoption of all the various papers read, and it would be understood, without objection, they would be received and referred for publication. It was so ordered.

Mr. Alpers was called on to present a paper on the subject of "Buying Goods," which the Chair explained he had been prevailed on to write:

BUYING GOODS.

BY WM. C. ALPERS.

The low selling-price of many commodities generally sold in pharmacies has become such a universal evil, that it may justly be said that at least 99 per cent. of all pharmacists suffer more or less by this deplorable state of affairs. It is natural, therefore, that such an evil should be considered, not only by the individual, but also jointly by pharmaceutical associations, whether local or national, and that the best talent in our profession should have worked for years to find satisfactory remedies. Various plans have been invented and suggested; heroic and praiseworthy efforts made in this direction.

In the majority of arguments touching on this subject, we find a tendency of attributing mischievous and wicked motives to those who sell at remarkably low prices, be they pharmacists, grocers or proprietors of department stores, and it is often stated that pharmaceutical goods are especially selected and sold at cost or even less, for the purpose of using them as catching advertisements, and thereby deceiving the public. Now while it may be true that once in a while such a mischievous motive exists, induced very often by abusive attacks on this method of conducting a business, it is yet by no means the rule. A sane business man, particularly one who has charge of large concerns and must give account of large invested capital, is not guided in his doings by smallness, meanness or narrowness. He is subject to the same general influences of the trend of trade, and being generally a sharp, keen observer he discovers in advance where a successful move of this kind can be made, and he is not willing to risk his reputation or position for the sake of spiting his neighbor. If we inquire among other business men, grocers, book-sellers, music-dealers, jewelers, etc., we will hear the same complaint. They will tell us that certain of their goods are given away by large dealers, in fact, their complaints and tribulations are precisely the same as ours. This will show us that such a practice is not directed against any particular trade or business; it is rather the modern evolution of the retail trade, it is the natural consequence of the investment of large sums in retail business, whereas in former years capital was only invested in wholesale or importing business, and the retail business left to the man with small means. It is not the object of this paper to consider whether such evolution has been beneficial or damaging to mankind in general. The fact remains that stores where such large capital is invested are extremely popular, that they increase rather than decrease, and that there exists no machinery of law that can stop their further development.

At first sight, therefore, it seems that efforts on our part in combating

the large dealer would be hopeless, even admitting that his influence ought to be combatted. An evolution, however, of such magnitude and universitality cannot work mischief alone, the common sense of mankind would revolt against it, and it would have been crushed out long ago if it had not its beneficial sides. It has always been my opinion, I dare say one of the principles of my business life, to watch those that are more successful than I, to find the causes why they succeed where I fail, and to see if my failure and their success cannot teach me a lesson. If my competitor is more successful than I am, it does not appeal to my good judgment or common sense to say that his methods are wrong and mine are right. Success in business is not a theory, but a fact, and is not accomplished by chance or opposition. If the correctness of these thoughts is admitted, we can learn at least one good lesson from our larger competitors, a lesson which it seems to me has been steadily ignored in the gigantic efforts to better our condition.

There are probably a series of reasons why large dealers can sell goods at lower prices than we. Let me point out only one of them, and this reason is that they buy cheaper than we do, and buying cheaper, they can sell cheaper. One of the steps of the commercial evolution of modern times has been the gradual reduction in the number of middlemen that stand between the manufacturer and the public. The oftener goods are handled and passed from one business to another, the higher their price must naturally be, and the direct transmission of merchandise from the producer to the consumer is one of the leading principles of large dealers. It therefore seems that we should heed this lesson and pay more attention to the *buying* of goods. As long as we pay prices for goods which are as high as those for which our large competitors can sell them with a good round profit, we cannot expect to compete with them. There is no one article in the world, and never will be, that cannot be bought to greater advantage if bought in large quantities. Trade discounts and cash discounts are not benefits that are granted the buyer, they are the positive and just *right* of the buyer which he can demand and will demand. The final success in all economic matters depends on the continued reproduction of labor; so capital, small or large, which is only accumulated labor, must again be productive, and its power and investment must be recognized by those who wish to obtain it. This is the fundamental principle of all trade, and will remain its fundamental principle, because without its recognition the very impetus of invested capital is taken away, and dullness and stagnation will be the result. In this direction, then, our efforts should be led. Instead of buying small quantities of goods twelve or twenty times a year, a large quanty should be bought at one time. A strict record of all purchases should be kept by records of stock cards, which I have repeatedly described and recommended in this Association. A record of all prices for years back should be at the pharmacist's disposal

at a glance, and in this way a proper measure of the various purchases obtained. It will, of course, be said at once that in order to carry this out in all details would require a larger capital than the average pharmacist has at his disposal. This is certainly true; but the first answer to this will be that hundreds of pharmacies in this country have been started, and are starting every day, that from a commercial standpoint have no right to exist. We all know that again and again, without any business experience, and often without the capacity of conducting business successfully, young men will start in business with almost no capital, induced by agents of wholesale houses who are willing to run the risk of long credits and doubtful returns. These young men must of course pay the highest prices for every article that they buy, and they start under an enormous load of unpaid bills, far in excess of the reasonable allowance for the size of their business. Their calculations of the cost of goods and the profits they must make are wrong from the beginning, and often remain so until they break down, or throughout their whole lives. They take away just enough business from established stores to also ruin the latter's prosperity, without being able to show in the least any benefit to themselves or the public. These words may be hard and appear heartless, but they are true and according to facts. One of the objects of united efforts in this direction should, therefore, be to induce jobbers and wholesalers not to accept orders from beginners of new stores, unless the whole first purchase is paid for in cash. Such an arrangement would in the course of some years be of enormous advantage, not only to the profession, to the retailer now in business, to the public in general, but principally to those deluded young men who in an outburst of misdirected enthusiasm waste their energy, and are more miserable as proprietors than they were as clerks.

Coming back to the buying-prices of goods where individual capital for large purchases is lacking, a remedy of the evil conditions consists in a combination of a number of druggists in each city for the purpose of buying jointly. Just as a large department house is to some extent a combination of many smaller businesses who all buy jointly and all share the advantage of such buying, so in every city where a number of druggists is less than two hundred, a club can be formed and successfully maintained. In large cities there is, of course, room for more than one club. Wherever such clubs or organizations have been formed they have been successful. With an investment of $200 from each member, a considerable capital can be invested, and it is a fact that in some cases the invested capital has been turned over more than twelve times in one year. The management of such an organization does not amount to more than three per cent. in small cities, that is, little more than the cash discount which is obtained in most instances, so that the full trade discount which is never less than 10 per cent., and runs up to 25 per cent. in some goods, will accrue to the benefit of the stock-holders.

The goods selected should be, of course, such as are the best sellers in the respective vicinities, beginning with the leading patents, extending to chemicals, where the possible profit is very large, taking in rubber goods, as atomizers, syringes, etc., the manufacturers of which grant enormous jobbing profits, and thus going through the whole line. Even glassware might be bought jointly at a remarkably lower price than each dealer pays now for the same.

An organization of this kind in each city would exert a very beneficial influence on trade in general. The relations of druggists to each other would become much more harmonious and satisfactory than they are now; they would be tied together by the strongest tie, that of personal interest, and small jealousy and envy would be eliminated much quicker than by other methods. There could even exist a combination of such clubs in a whole county or state, and the great amount of benefit and blessing that could be derived from them is incalculable.

In advancing this method I do not wish to be understood that I personally advocate low prices. Since the beginning of my business career I have advocated high prices, not only in agitation and words, but in fact. But I believe that wherever there is a benefit to be derived in business life it should be taken advantage of, and those who may be less fortunately situated than I am, and are compelled to yield to the public demand of low prices can by this system recover some of their profits, and continue their business in comfortable ease. Nor do I wish to say that this is a universal remedy for existing evils; it is only one of the points that should be earnestly considered by every progressive druggist, and the execution of which should be made one of the leading objects of united efforts.

I will never forget the words of one of the most successful business men of this country, whose methods I once had the privilege of observing. I expressed my surprise at the small profits he derived, and he replied, "There is no profit in selling goods, the profit is made in buying them." Let us heed this lesson and act accordingly.

The paper of Mr. Alpers was applauded, and on motion of Mr. Stewart, was received and referred for publication.

The Chair mentioned the receipt of a communication from the Horlick's Food Company, with an accompanying resolution, with request to bring before the Section, but on motion of Mr. Hynson, seconded by Mr. Carter, it was laid on the table without reading.

The Chair called for the presentation of a paper on "Unfair Fire Insurance Rates," by Mr. Frank H. Freericks, but Mr. Hynson moved to first proceed to the election of officers for the ensuing year, as the hour was getting late and the members were leaving the room. Mr. Hopp protested against this, as he said Mr. Freericks had a very interesting paper to present, and when he got ready to read it there would be nobody to hear him. Mr. Hynson's motion prevailed, however.

The Chair called for nominations for Chairman of the Section, and Mr. Hynson nominated Mr. Frank H. Carter, of Indianapolis, though he confessed if the Association should meet at Indianapolis next year and Mr. Carter was made Local Secretary, he would have to give up the Chairmanship of the Section. Mr. Carter said he thought it would not be wise to elect him. Mr. Hopp nominated Mr. Hynson for Chairman. Mr. Seabury nominated Mr. Alpers, of New York, and spoke as an ex-Chairman of the Section, and as an enthusiastic supporter of it, for a man of large experience and active mind. He then moved to proceed to a ballot, but Mr. Alpers withdrew his name from nomination, and Mr. Carter followed suit.

Mr. Mayo then nominated Mr. Lewis C. Hopp, of Cleveland, for Chairman, and Mr. Hynson seconded the motion, and moved that nominations be closed and the Secretary directed to cast an affirmative ballot electing Mr. Hopp Chairman for the ensuing year. This motion prevailed, and the Secretary announced he had cast the ballot as directed.

Nominations for Secretary were called for, and Mr. Knox, of Detroit, nominated Mr. H. D. Kniseley, of Indian Territory. This motion was seconded by Mr. Freericks, and the Secretary was ordered to cast the ballot of the Section electing Mr. Kniseley, which he did.

The Chair called for nominations for Associates on the Committee, and Mr. Mayo nominated Mr. L. Wilcox, of Waterbury, Conn.; Mr. Seabury nominated Mr. Chas. A. Rapelye, of Hartford, and Mr. Stewart nominated Mr. J. W. T. Knox, of Detroit. On motion, nominations were closed, and the three gentlemen above-mentioned were duly elected Associates on the Committee for the ensuing year.

Mr. Hynson here announced that Mr. Hopp had expressed his inability to serve as Chairman. Thereupon, Mr. Stewart nominated Mr. Thos. F. Main, of New York, but he promptly declined. Mr. Lillie, of Oklahoma, then nominated Mr. Mason, of Detroit, but he also declined. Mr. Cliffe wanted to nominate Mr. Pritchard, of Pennsylvania, but Mr. Hays reminded him that no nomination could be made of one not present. Mr. Hopp thereupon renewed his nomination of Mr. Hynson, made in the first place, and Mr. Freericks seconded and moved to close nominations, and that the Secretary cast the ballot of the Section, electing Mr. Hynson Chairman. This motion prevailed, the ballot was cast, and the Chair declared Mr. Hynson duly elected. Mr. Hynson said he would consent to serve, because so many of the members had declined.

Mr. Freericks was then given the opportunity to present his paper on fire-insurance rates:

UNFAIR FIRE-INSURANCE RATES.

A REMEDY.

BY FRANK H. FREERICKS.

Conservatively estimated, the retail druggists of the United States pay annually for protection against loss by fire the approximate sum of $1,250,000. Are they securing value for their money? This question is certainly one of interest to those who are concerned with the commercial features of American pharmacy. Surely it ought to be, when it may be safely stated, that the druggists of this country are paying approximately $500,000 per annum more for insurance than the nature of their risks requires.

It is unnecessary for me at this time, and for the purpose of this, to be brief paper, to enter into the history of the frequent attempts at forcing a change of these inequitable conditions, for I believe it be generally known that such attempts have been made in various states of the country. My object to-day is merely that of pointing out the reasons for failure in the past, and then to call attention to a plan, by means of which the heretofore impossible, becomes a comparative easy possibility.

For the protection of their respective citizens, our various States have found it necessary to enact more or less stringent laws governing companies doing a fire-insurance business. These laws, while occasioning what at times appears to be unnecessary hardships, are by reason of having to be general in applicability, eminently just and proper, and constitute a safeguard for the assured, which it is not only wise, but which it is a duty for each State to secure its citizens. It is, however, on account of these very laws that every effort but one to organize druggists' insurance companies have failed, since they involve as a rule, a financial basis of safety which it has been impossible for the limited number of druggists of any one State to secure.

The States very generally have separate laws for the control of mutual and of stock companies, respectively. The usual (there are some exceptions) requirements for a mutual company, before it is permitted to engage in writing insurance in its home State, is an actual possession of $10,000 in cash and premium notes equal to from three to five times the amount of each member's annual premium. The usual requirement for a stock company before it may engage in business in its home State, is a capital of $200,000, fully paid, and invested in the best securities. Companies, both mutual and stock, desiring to do business in other States, where they are regarded as foreign companies, must have, under the laws of most States, a capital of not less than $200,000, differing only as between stock and mutual in so far as that some States require of foreign mutual companies an actual deposit of $200,000 with their respective treasurer of State, while foreign *stock* companies need only to have this capital invested, or

on deposit, under the supervision of the insurance department of the company's home State.

In order, therefore, to permit a mutual company to do business in its home State alone (excepting some that have even more stringent provisions), it becomes necessary that its incorporators write insurance for at least a million dollars, and that each policy-holder give a premium note amounting to from three to five times the amount of his annual premium. This is a very difficult undertaking for the reason that it is far easier for a company to secure policy-holders after it has permission to do business than before, and for the reason also that some one or a number of persons must undertake to devote both time and money without expectation of reward, to an extent which it seems unreasonable to expect. It would be comparatively easy if this amount of insurance could be written and secured in a number of States, but as already explained, such mutual companies are limited to their home States. It is even more difficult for druggists of any one State to expect to raise from among their own number the amount of $200,000 by stock subscription, but it is in connection with a *stock* company, that the co-operation of druggists from various States may be enlisted on an absolutely practical basis, and in that manner they may hope to carry through what otherwise is demonstrated a practical impossibility.

Having presented at the last convention of the National Association of Retail Druggists a plan for the incorporation of a druggists' fire insurance company, national in scope, which was received with considerable attention at that time on the convention floor, and in which there has since been manifested a considerable interest by correspondence and otherwise, it has become clear to me that no explanation can be too lucid in order to afford an opportunity for the clearest understanding. Before entering, therefore, into a very brief summary of the underlying basis for the proposed company, it seems to me well, to present a draft of what the articles of incorporation and regulations to govern the board of directors, should be.

ARTICLES OF INCORPORATION.

These Articles of Incorporation of The American Druggists' Fire Insurance Company,

Witnesseth, That we, the undersigned, a majority of whom are citizens of the State of Ohio, desiring to form a corporation, for profit, under the general corporation laws of said state, do hereby certify:

First, The name of said corporation shall be The American Druggists' Fire Insurance Company.

Second, The principal office of said corporation shall be located at Cincinnati, Hamilton County, Ohio.

Third, Said corporation is formed for the purpose of insuring retail druggists and others, of the United States of America, against loss and damage to their houses, buildings, goods, merchandise and other property by fire, lightning, explosion and tornadoes. In the operation of said corporation it is hereby agreed and stipulated by and between the incorporators and stockholders, that the entire issue of the first authorized stock after

the organization of this corporation, to increase the capital thereof, shall be first offered to such of the corporations' policy-holders, as are not holders of its original stock issue, in accordance with such rules and regulations as may be decided upon by the stockholders or the Board of Directors.

Fourth, The capital stock of said corporation shall be Two Hundred Thousand Dollars ($200,000.00), divided into eight thousand (8000) shares of twenty-five dollars ($25.00) each.

In witness whereof, we have hereunto set our hands this —— day of ———, 1905.

CODE OF REGULATIONS SUGGESTED FOR ADOPTION BY THE STOCKHOLDERS TO GOVERN THE BOARD OF DIRECTORS OF THE AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY.

ARTICLE I.

Object.

SECTION 1. The object of this company is to insure retail druggists and others of the United States of America, at a minimum cost, consistent with conservative management, against loss and damage to their houses, buildings, goods, merchandise and other property by fire, lightning, explosions and tornadoes; and to make good unto them such immediate loss as may occur to the property specified—not exceeding the sum insured, as may be embraced in the written portion of a policy, the general form of which shall conform with other standard insurance policies, and to cover one or more of the aforesaid causes of loss or damage as may be agreed upon.

SEC. 2. This Company may insure, by special clause in policy, and charge proportionately for same against loss or damage by lightning, explosions and cyclones, but only concurrently with other companies, except by special policy.

SEC. 3. This Company may issue policies for three or five (3 or 5) years, at the usual rates, on buildings, household goods or anything but stocks of merchandise.

ARTICLE II.

The books of the Company shall be kept at the principal office, and the election of directors and officers shall take place at said office.

ARTICLE III.

SECTION 1. The annual meeting of the stockholders shall be held at the principal office of the Company on the second Tuesday of January of each year, between such hours as may be agreed upon by the Directors—for the election of twenty-one Directors, all of whom shall be stockholders, to serve for one year or until their successors have been duly elected and qualified, and for the transaction of such other business as may properly come before said meeting; provided, however, that the first Directors, after organization, shall serve only until the first annual meeting following incorporation.

SEC. 2. Notice of the time and place of holding the election for Directors or of any other meeting of the stockholders shall be sent by mail to the address of all the holders of stock, as the names shall appear upon the stock books, at least fifteen days previous to said meeting, and no transfers of stock shall be made upon the books of the company within five (5) days of said meeting.

SEC. 3. Special or other meetings of the stockholders may be held at any time when so ordered by a majority of the Directors, or when application is made in writing to the President, setting forth the object of such meeting, and signed by the stockholders representing at least twenty-five per cent. of the capital stock of the company, and no other business shall be transacted than that specified in the call.

SEC. 4. The corporate powers, business and property of the company shall be exercised, conducted and controlled by the Board of Directors.

SEC. 5. A majority of the Board of Directors shall constitute a quorum for the transaction of any business that may come before it, and they may delegate any of their powers to one or more of the officers of the company, or to any committee, when done in regular session.

SEC. 6. At any meeting of the stockholders a majority of the stock present, represented either in person or by proxy, and voting upon any question, shall decide that question.

ARTICLE IV.

SECTION I. The officers of the company shall consist of a President, a Vice President, a Secretary, a Treasurer, and such other officers as may be deemed necessary by the Board of Directors.

SEC. 2. The Company shall appoint a Managing Agent for each of the States wherein it transacts business, and such Managing Agents shall be residents of the respective State for which they are appointed.

SEC. 3. The President and Vice President of the Company shall be elected by the Directors from their number as soon as possible after their election, to hold office for one year, or until their successors have been elected and qualified.

SEC. 4. The Secretary, Treasurer, Managing Agents, and such other officers and employees as the Board of Directors find necessary, shall be appointed by it, to hold office or employment during such time as it may deem best in the interest of the Company.

ARTICLE V.

The Board of Directors shall have power to fill any vacancies that may occur in the Board, either by death, resignation or otherwise. They shall fix the salaries and allowances to each and every person whom they shall appoint in the employment of the Company, or change the same, and shall require such bonds as they may deem necessary. The Directors shall receive the sum of five dollars ($5.00) per day for each day actually engaged in the service of the Company, and their railroad and other necessary traveling expenses from and to their homes when in attendance upon the meetings of the Board or other business of the Company.

ARTICLE VI.

SECTION 1. The Board of Directors shall make rules and regulations to govern Managing Agents in the respective States for which they are appointed, in accordance with the laws thereof.

SEC. 2. It shall be the duty of the Directors of this Company to control, as far as possible, the distribution of the stock, in order that it may be kept amongst the retail druggists of the country—and that large amounts of it may not be held by single individuals, and for the aforesaid purposes the Board of Directors are hereby authorized to appoint a suitable number of persons, to be and constitute a Board of Control, who shall use all lawful means for carrying out the aforesaid purpose.

ARTICLE VII.

SECTION I. The profits of the Company shall be determined in accordance with the law.

SEC. 2. The Company shall establish and maintain a reserve fund, out of its profits, which shall be equivalent to, or not less than, one per cent. of the aggregate amount of all policies in force at the end of each fiscal year. This reserve fund shall be established gradually by placing to its credit 25 per cent. of the net surplus profits of the Company annually, until the total amount is equal to said one per cent. Thereafter, the said reserve fund shall be so maintained by placing to its credit the required amount, annually, not to exceed in any one year 25 per cent. of said net surplus profits.

SEC. 3. Dividends shall be declared at the annual meeting, by the Board of Directors, out of the net surplus profits of the Company.

ARTICLE VIII.

This Company shall increase its capital stock to three hundred thousand dollars ($300,000.00) at the end of its fifth fiscal year. This increase of $100,000.00 in the issue of capital stock shall be first offered for subscription to the earliest policy holders in this Company, who are not holders of the original stock, at the same price at which the original issue was sold, and in such manner as the Board of Directors may at that time direct.

ARTICLE IX.

This Code of Regulations (excepting Article VIII thereof, which shall not in any manner be altered, amended or repealed, until after its provisions have been fully complied with) may be amended or altered by the vote of a majority of all the stock of the company.

An insurance company incorporated on the lines indicated may expect to insure at least one-fifth of the insurable drug-store property, within a reasonable time. It will be able to at once reduce on a very safe basis the present insurance rates as fixed by the board of underwriters at least 25 per cent. It can safely assure its stockholders an annual dividend of 20 per cent. In other words, any one subscribing for $100 of the proposed company's capital stock, which to cover initiatory expense must be sold at $105, may expect to add to the actual saving of 25 per cent. on his present premium rate an actual earning of $20 per annum, so that an average risk of $2,000 would cost him no more than the interest on his investment. In addition to the foregoing, the conservative estimate of expecting to insure only one-fifth of the insurable drug-store property, will enable the company, after paying average losses, as indicated by statistics running over a period of ten years, to still retain an annual surplus of over $40,000, thus offering first an opportunlty for establishing a large reserve fnnd, and thereafter, a further reduction in premium rates.

In bringing this matter before this Section, I am well aware of the opinion occasionally expressed, that a proposition which involves the saving only of from five to twenty-five dollars per annum for every druggist, is one really not of sufficient importance to receive attention at the hands of a national body of pharmacists, that, in other words, such matters should be left to, and work out under, the direction of local and state organizations. In view of the fact, however, that such an endeavor is practically impossible by the isolated effort of those who can attract the attention of local or state organizations only, and in view of the fact also, that the generally inequitable rates, cost the druggists collectively, a sum approximating $500,000 per annum, it seems to me that the matter should not pass by unnoticed, with an organization having both the purpose and the ability to be enlisted in whatever may be to the retail druggists' advantage. In this I do not desire to be understood as advocating that the American Pharmaceutical Association go into the insurance business, but, I do advocate, that its members through the organization, become interested in the proposition, so that, by means of a general co-operation among them, in all parts, the undertaking become a comparatively easy one, to the great mutual advantage of all concerned.

Mr. Freericks said the statements he had made were borne out by statistics running over a period of ten years. He expressed regret at his small audience, and said he had hoped the matter would receive general attention at this Section meeting.

The Chair expressed his personal regret that it had not been possible to bring this matter before a full house, and asked for action on the paper.

On motion of Mr. Hynson, the paper was received and referred to the Publication Committee.

Mr. Hynson then moved the adoption of the following resolution:

Resolved, That this Section requests that the Council provide, as a trial, for the next meeting of this Association two sessions for this Section, to be held at the same time as are held two sessions of the Scientific Section, and that two stenographers be engaged for these sessions, and if possible Mr. McLean be given to this Section.

Mr. Mayo moved to amend to strike out the reference to Mr. McLean, as he was in favor of the resolution and it would meet with objection in the Council if it bore the request to take Mr. McLean from the Scientific Section.

The resolution as amended was then adopted.

Recurring to Mr. Freericks paper on fire-insurance rates, Mr. Hynson said he thought if there was any way in which the Section could help Mr. Freericks in the matter it ought to do it. Mr. Mayo seconded this suggestion, and called attention to the fact that it was Freericks who first proposed the adoption of the serial-numbering plan as applied to proprietary articles, which was pooh-poohed from one end of the country to the other at the time, and which he amongst others thought wholly impracticable, but which had since proven its worth.

Mr. Hopp explained that Mr. Freericks did not wish the Association, as such, to undertake the formation of such a fire-insurance company; what he desired was an endorsement of the plan by the Association,—or by the Commercial Section,—thereby making it easier to carry out the idea with the druggists of the country.

Mr. Freericks himself then explained just what was desired from the Association, and Mr. Carter offered the following as embodying this idea:

Moved, that the paper read and plan submitted by Mr. Freericks on Druggists' Fire Insurance is worthy of the careful consideration of retail druggists.

This motion was seconded by Mr. Hopp and carried.

The following papers were read by title and referred:

DISPLAYING GOODS.

BY ANTHONY M. HANCE.

It is one of the axioms of business that showing goods is the best way of selling them. And the better they are shown the more readily they are sold. Hence, such expressions as "well shown is half sold."

Showing goods well is also the best way of advertising them, and as most *advertising* is for the purpose of selling goods, its value depends on the amount of goods sold by one plan or another.

The man behind the counter is a *salesman* only so far as he actually disposes of goods to buyers. Up to that final stage of his efforts he is, more strictly speaking, an advertiser of the goods. And his success as a

salesman depends very considerably on his qualifications as an advertiser.

His advertising is done to best advantage because at shortest range; and its special value as preliminary to sales depends largely on his personality, his general appearance, his eye, his voice, his knowledge of the goods, manner of showing them and ability to command a hearing.

For bringing the greatest number of possible buyers within the influence of this short-range advertising by the salesman, there is no more effective agency—for most lines of retail trade at any rate—than a show-window properly used.

This fact has always been recognized and acted on by the most enterprising merchants in all branches of business, and is to-day more popular than ever before, and not by the leaders only, but by the rank and file.

All windows are alike in this respect—they reveal a good deal about the persons who are responsible for their appearance.

Show-windows may attract or turn away trade. *They* make a first impression on a merchant's possible customer—the passer-by; and the kind of impression they make may easily determine in many cases whether or not an occasional customer is to continue to be merely that, to be rendered positively antagonistic, or turned into a regular customer.

Important questions for every merchant to ask himself are, therefore, such as these:

Who is responsible for the appearance of my show-windows?

Am I getting from them all the help I can?

Are they doing me any good?

Am I sure they are not doing me harm?

Like other things the show window is a product of evolution, it is a development; and it would be interesting, if practicable, to trace this development step by step, from the time when a window was only thought of as a means for admitting light, to the modern bulk window that "shows" goods. In fact, nowadays, in the up-to-date store the window as a light-admitter is of secondary importance to the window as more or less of a "show-case," in which wares are spread before the eyes of the passer-by.

But just when and where the first and subsequent steps were taken in the evolution of the show windows, it is impossible to say. There is little, if any, literature on the subject; but the general process can doubtless be shown by picturing what probably took place in the evolution of the drug-store window.

At some time and place in the far distant past an apothecary had an inspiration. He knew, by having been taught, or finding it out for himself, that he could make bright-colored solutions and the thought occurred to him that by filling some bottles with blue, red or green liquids and putting them in his little window, he would mark his shop out from all others as that of the apothecary.

The plan must have worked well, and attracted his competitors' atten-

tion first; and then the novelty of it brought all the curious among his townsfolk to look at what the apothecary had done. Gradually, other apothecaries thought the idea a good one and adopted it. More or less rapidly the practice grew in favor until the colored glass bottles, gradually developing into ornamental globes and jars, became recognized drug-shop symbols, throughout the civilized world.

This, therefore, was one step, and an important one, in the evolution of the apothecaries' window; the owner had found out that it could be turned to direct commercial advantage.

Encouraged by his first success, this old-time druggist, or possibly one of his successors some years later, thought it would be a good idea to put one of his night lights behind these bottles or jars of colored liquids. This also proved a success, made a mild sensation perhaps at first, and far up and down the street, until the early bed-time hours of those days, the gleaming colored lights shone out amid the surrounding darkness, pointing the way to "Ye Apothecarie's Shoppe." Here was an additional step; the druggist had learned something about how to make his window a guide to his shop, and thus easier for possible customers to remember its location and find their way there.

Now, from these colored bottles, illuminated by night, to the placing of goods in the window was but a short step. It didn't take an enterprising druggist very long to ask himself, "If people are attracted by bright colored glass globes, why not by crude drugs?"

And so he acted on his new idea and put in his window, one day, instead of putting them all in cupboards or on his shelves, some fresh packages of drugs.

He found that this awakened more interest in the minds of neighbors and strangers who had never known about him before. From that time forward the apothecary found that his window could be made a salesman, as the change came on, from a few crude drugs to the thousands of manufactured preparations carried to-day.

Soon the flat, narrow windows became inadequate; succeeding generations saw that the small panes with their heavy frames obscured the effect. Then was born the general bulk window, into which gradually came its generous panes of French plate.

Then began the real science of window dressing, and the merchant prince who now counts his window among his best salesmen, can thank that druggist of the far away past, whose sensational enterprise was the filling of glass bottles with red, green, and blue colored liquids.

The successors of the man who first put goods in his window have been many and varied in kind; indeed the show windows of the country even at this day show almost every phase of the development; from the most crude and useless, except as light-admitters, up to those of the great department stores, sacrificing light, doorways and space, and spending

enormous sums of money in order to reap the full advantage of the value that their so-called "windows" possess, but which are, in reality, immense weather-proof show-cases now.

Window-display being, therefore, so important a part of advertising, it is natural for any one interested in the subject to ask if experience has enabled any general rules to be laid down by which window display advertising may be undertaken with the best assurance of success.

The answer to such a question is that there are several points about the making of window displays; concerning which there is a practical unanimity of opinion among those who have had longest and most valuable experience in the work, and which, therefore, may be set down as rules, which it is wise to follow:

(1) Display but one thing or class of things at a time.

The idea of unity places such emphasis on the thing, or class, that curiosity is excited, interest aroused, and sales result which would not otherwise have been made.

The psychological fact underlying this seems to be that the average human mind is capable of instinctively grasping but one fact or group of facts at a time. Anything beyond that is the result of more or less effort.

(2) Choose carefully the subject of the display. All articles are not equally well adapted for window displays. Study times and seasons. Adapt the displays to circumstances.

(3) Animate nature and mechanical movement are valuable adjuncts to window displays, attracting attention which goods themselves might not secure.

(4) Avoid anything like vulgarity or bad taste.

(5) A good window display partakes largely of the nature of a picture; it should be as artistic as possible, for that reason, and it is necessary therefore that due attention should given to such essentials as proportion, color, harmony, etc.

(6) While the display should be as attractive as possible to the eye, it should be simple and clear to the understanding. The idea it is intended to convey should be so unmistakable that the passer-by can take it in at a glance. The most desirable customers have seldom the time or the desire to stand and solve a puzzle in a shop window.

However, this depends principally upon location, circumstances, etc., and suggests a separate treatment of the subject not contemplated in this paper.

In conclusion, it may not be out of place to state that the writer—through his firm's many publications—was probably the first to point out to the druggists of the United States, Canada and Great Britain, the advertising value of their windows when properly utilized. This was all of ten years ago, since which time, though many changes have been made, resulting in great benefits to those who were far-sighted enough to avail

themselves of their opportunities, there is vast room for improvement in thousands and thousands of other drug-stores to-day.

FOR THE LABORATORY.

BY O. W. BETHEA.

Medicine to the layman is a thing of mystery. From the shoeless days of joyous boyhood, when he is taught to raise his hat to the venerable old family physician, there is imbibed a certain respect for things medical—a confidence which, as mind influences matter, is the fortunate foundation of many a cure, and, alas, is the ground-work on which is erected many a pile of humbuggery.

We of the inner circle, so to speak, know that the average patent medicine is not the pure and unadulterated fraud it is represented to be by some of the current publications, but is simply the formula of some able physician or competent pharmacist, "simply that and nothing more." I sometimes think that it is a pity that more was ever claimed for it. Master minds for generations have been striving to create a demand, in its strongest sense, for ready-prepared remedies, and we see the twentieth century world-healer, like the hero of Carlisle, the enthusiast of Irving, the villain of Sale, at one moment breathing out in seductive accents the delights of a sensual Paradise and the next with voice of thunder hurling forth the horrors of a made-to-order eternal damnation, and, like Mahommed, they have a following whose name is legion.

Misce secundum artem with our daily allowance of murders, base-ball and war news we have the nerve-racking illustration of the poor wreck of a female, with emaciated features buried in fleshless fingers, or the mangled remains of the man who might have been an Apollo by taking somebody's specific. Perchance to cool our fevered brow we seek the alleviating influence of the open air when—blessed vision—the near-by bill-board fairly scintilates with happiness; rays of life and love strike out from its multi-colored surface, and the once weary passer-by goes on his way rejuvenated by the view of the transcendentally happy family, the result of somebody's panacea, and he almost raises his hat to the radiant cardboard-maid in the window of the corner drug-store, in the bloom of perfect womanhood, still clinging to her friend and deliverer, a gigantic bottle. Sickness seems an impossibility and death nothing other than suicide, yet from the wretched abodes of groveling poverty to the palaces of kings mortals are still gathered to their fathers, while the cool sea-breezes wafted across the swollen bosom of the Atlantic continue to rustle the silken curtains in the summer mansion of the cough cure benefactor, and financial princes remain transfixed in speechless abashment in the presence of marble palaces built with pills.

To attempt to stem the rising tide of popular favor were madness extreme. Millions of dollars are fairly quivering in an intensity of desire for

exchange. Oh Beloved, "Kick not against the brick." Give them what is wanted—pure, clean, full and honest, and see to the bottling thereof in your own snug little laboratory.

Think what a small per cent. of human ills, will, or can be, directed to the regular prescribers, and the lack of real necessity for much of it, and if modern schools of pharmacy, current drug journals and the magnificent array of text-books, dispensatories and formularies cannot fit the disciple of Galen to prepare the where-with-all to meet the popular requirements from his own laboratory, then may we cease to be acknowledged a profession and the tall grass o'er our early graves no more than "Implore the passing tribute of a sigh."

THE PROPOSED RE-ENACTMENT OF THE STAMP TAX OF 1898.

BY THOS. D. MCELHENIE, BROOKLYN, N. Y.

There have been some intimations in the secular and pharmaceutical press, that, to offset a present or prospective deficit in the national treasury, the Stamp Tax of 1898 might have to be again put in force, at least on medicines.

Now there is no more reason for taxing a medicine to support the Federal Government because it is a medicine than for taxing shoes, or clothing, or machinery, or anything else. The tax when in force worked a hardship on the retail druggist because of the increased prices demanded by many proprietors and having also to stamp his own little specialties, having only a limited retail sale.

But there is a basis for taxation if needed which would be right and reasonable and would be no hardship on those who paid it. Let a tax be laid of one per cent. or even one-half of one per cent. on the printed retail price on all articles having the protection of a *trade mark* issued by the United States Government. This would apply to a great variety of goods outside the drug trade which have an enormous volume of business. The stamps should be printed in the necessary fractions of a cent to cover articles from five cents upward.

There would be ample reason and warrant for such a tax in the circumstance that the United States backs the owner of the trade mark and punishes infringers. The cost of such suits might properly be chargeable against the fund raised by the tax.

It might very well be made a permanent tax and for a distinctive name be called "Inland Revenue." The volume of business, both domestic and export, in trade-marked articles is so large that if the tax were honestly collected and administered there would never again be a deficit but a surplus instead.

There could be no evasion by those liable to the tax as every trade mark is of record in the Patent Office.

I believe this would be a proper subject for the presentation of a memorial to Congress by the Commercial Section of the American Pharmaceutical Association.

There would be doubtless a powerful opposition from many wealthy owners of trade marks outside the drug trade, but so there would be opposition to any imaginable legislation involving a tax, except in time of war. If the members of the Congress are satisfied that it is a right and reasonable proposition they might change their luck by passing it in spite of opposition and bribery.

The surplus which would probably result might very well be devoted to the purposes of Coast defense or similar military or naval use to become available in time of war.

On motion of Mr. Hopp, the Section then adjourned.

REPORT

ON THE

PROGRESS OF PHARMACY.

From July 1, 1904, to June 30, 1905.

By C. Lewis Diehl.

INTRODUCTORY.

Before this report can appear in print the new Pharmacopœia will have been issued and its text will have become the legal standard of quality and a guide for the preparation of medicines throughout the United States. This consumation was forecasted in June of this year by the official announcement of the Board of Trustees, that the printing of the revised Pharmacopœia was so far advanced that an early issue could be looked for with certainty, and came as a great relief to those who had chafed under the prolonged delay of the work, which will hereafter be known as *The U. S. P., VIII.* The unusual delay in its completion had in fact given rise to so much unfavorable criticism that it was only through the exercise of resolute firmness by the Committee of Revision that the Pharmacopœia could be completed satisfactorily and in conformity with the instruction of the Convention of 1900. It must be remembered that the Pharmacopœia is no longer merely "in name" a work of national scope, but that it has become such "in fact"; for it is now recognized as the standard authority by all the departments of our national government, as well as by all the states, in legal controversies arising from violations and infringements of poison laws and pure food enactments. Consequently it was incumbent on the Committee of Revision to carefully consider the definition of each article admitted into the Pharmacopœia so that the demands of quality and purity, while sufficiently exacting to secure efficient medication, shall not exceed the bounds of practicality, as had been the case under the definitions of the U. S. P., 1890.

In a paper written in response to numerous letters from physicians throughout the country, and a request from the Section on Pharmacology of the American Medical Association, the Chairman of the Committee of Revision, Professor Joseph P. Remington, elucidates this subject admirably by a brief review of the considerations that have confronted the Committee in the revision, and that have led to the changes and innovations effected. He says that among the important questions with which the present Committee has had to deal is that of

The Standards for Purity.—"In the Pharmacopœia of 1890 there are standards which have been found, by actual practice, far too rigorous and hypercritical. There is no necessity for prescribing chemical salts, which are microscopically or analytically free from harmless substances (provided, always, that the amount of such be accurately known, and a proper allowance made), and when it is considered that in some cases the cost of manufacturing such products adds 100 per cent. or over, to the price, the condition calls for immediate action. Chemical testing has reached a stage of far greater accuracy than ever was believed possible, and methods can now be employed which will determine the percentage of contamination with great precision."

"*The food and drug laws* in the various States have been a moving power within the last few years, in calling greater attention to deviations from the standards of the Pharmacopœia, but those who have instituted prosecutions have, in many cases, chosen absurd subjects as the basis of what might be properly called 'persecutions,' and have permitted far weightier infractions of the law to pass unnoticed. Pharmacists have been forced to pay penalties for trifling deviations, and large manufacturers and wholesale dealers have often been severely left alone. When the food and drug laws are wisely and efficiently administered, they will prove of immense value to the country by punishing a class of druggists who regard cheapness, rather than quality, as of the first importance." "In view of these facts, the Committee of Revision has established the principle that it is far better to introduce standards which can be readily attained, and then look to the laws to prosecute offenders who do not comply with requirements so easily within their reach. What is known as

A Purity Rubric will be attached to substances capable of being tested, and this will be framed so that the lowest limit of the standard is distinctly stated. "Another great question arising out of the passage of the food and drug laws has been the strained construction placed on the laws by the judges of our courts. They have ruled that the standards required for medicines shall be rigidly applied to substances used in the arts. This may be a good law, but it is not common sense. Every one must recognize that the use to which a chemical is put must determine its standard of purity." "In order to bring relief from any trouble in this direction—to the court, the judge, and all—a clause will be inserted in a prominent

place in the new Pharmacopœia, stating that the tests in the books are to apply solely to substances to be used as medicines." In this connection it may be of interest to quote two papers on the use of

Food Preservatives, published in the "American Journal of Pharmacy" for November, 1904 (pp. 503-511)—the one by Dr. Henry Leffmann, considering the question of "where to draw the line"; the other by Dr. R. G. Eccles, discussing "the effect of food preservatives on public health." Dr. Leffmann observes that the preservation of food by artificial means is a necessity of civilized life. Some methods have been used from a very early period—among them cooking, drying, smoking, salting and pickling, and to a limited extend, freezing, spicing and sugaring. Mankind resorted to all these methods long before the chemistry and physics of the processes of fermentation, putrefaction and decay were known. The progress of organic chemistry has resulted in the discovery of several substances of marked antiseptic quality and comparatively little toxicity. The best known examples are formaldehyde, salicylic acid, benzoic acid, the naphthols, and one inorganic substance, boric acid. These substances are eminently adapted, from the manufacturer's point of view, to the preservation of food—very cheap, odorless, and colorless, and practically tasteless, each having its preferable application. When the authorities charged with the active prosecution of food adulteration began their work some years ago, in different parts of the United States, they found some of the above-mentioned preservatives in extensive and comparatively long established use, and the question of wholesomeness at once arose. Some of these authorities, acting on the assumption that all preservatives of ancient origin are safe, and all of modern origin are unsafe, have established the broad forbidding of all preservatives except salt, vinegar and wood-smoke; others have permitted limited use of boric and benzoic acids and their sodium salts. These distinctions in permission are evidently not founded on a scientific basis, and the action of certain authorities in placing the older preservatives on a permissible list and the newer ones on a forbidden list must be considered purely arbitrary. Experimental data are not extensive, and such as exist are either one-sided, or contradictory. What data are there to show that salt is entirely harmless in food? What proof have we that sodium benzoate is more objectionable than the ingredients of wood-smoke?

Dr. Eccles speaks strongly in favor of the use of food preservatives. He says, to advocate the use of preservatives in food is to advocate in behalf of pure food! Perishable foods subjected to delay in other than cold-storage transportation, cannot reach the consumer in a pure state if preservatives are not used; food may reach the consumer relatively pure and not remain so until consumed. But it may be asked, "are not preservatives harmful?" What if they are? No living being dare assert that they ever did the harm that decayed food has done. Moreover, there is not a

single recorded case of a human being having been injured by preserved foods. Salicylic, benzoic, boric acids, and their salts, have been used over twenty years, and no one can point to the record of a single person who has been injured or killed by any article of food containing them; while thousands have been killed and thousands more tortured through having used food that should have been, but was not, protected by these chemicals. In fact, in their strongest condition, these chemical preservatives are much weaker than the multitude of substances used daily in our foods *when they are concentrated*—the essences, spices, mustard; the phenols of smoked meats and fish; the flavors of butter, of all kinds of fruits, of cheese.

Pharmacopœial Assay Processes.—Although it is well understood that the number of assay processes has been largely increased in the new Pharmacopœia, Professor Joseph L. Mayer, in the Druggists' Circular of September, 1904 (pp. 195–196), makes a plea for an extension of such processes to all drugs and preparations that are liable to form the basis for prosecution under "drug adulteration enactments." He observes that up to a comparatively recent period there was a prevalent notion among pharmacists that the only official preparations which would be used as a basis for prosecution for "drug adulteration" were those for which the United States Pharmacopœia prescribed a standard and directed a method of assay. Recent work of the Board of Pharmacy has demonstrated the fact that this belief was not well founded. The Board is not only justified in its action in taking samples of preparations irrespective of whether or not the Pharmacopœia directs a method of assay for them, but is to be commended for its efforts to weed out those which are either deteriorated or are deficient in strength as a result of careless preparation. Nevertheless it would appear to be desirable that the standard shall be fixed and defined by the Pharmacopœia, and the author therefore suggests that this work be taken in hand by some sub-committee of the United States Pharmacopœia or the American Pharmaceutical Association, and, after being approved, be published in pamphlet form and regarded as official methods of analysis. These would be those used in connection with prosecutions, and the pharmacist would then not be so much in doubt with reference to the methods employed. Of course a great advantage would be found in the fact that all analysts making pharmaceutical analyses would be working under like conditions, which in work of this nature means much. Looking at the matter from various points of view there appear numerous good reasons why the suggestion to sanction the adoption of official methods of analysis of pharmaceutical products should be favorably received.

New Remedies and Trade-named Specialties will, as in the reports of the recent past, be found largely represented in the present report. It should be understood, however, that this is not because of confidence in their remedial value or importance as remedial agents, but rather because of

their liability to be prescribed promiscuously and under "coined names," which are frequently so nearly alike as to lead to confusion, if, indeed, not to positive disaster, and this is true not alone for the trivial compounds that are foisted on the medical profession, but with equal force of the .

Modern Synthetics. In the paper of Professor Remington, previously quoted, he has the following to say on this and kindred points: "Exceptional activity in providing therapeutic agents for the alleviation of disease has made the work of the Committee of Revision much greater than ever before, and it has been a task to make a judicious selection of the synthetics. Every physician must regard the present condition as confusing in the extreme, for no sooner has he commenced to learn the real value or worthlessness of a new synthetic than he is importuned to try another." "The committee has had to consider the question of copyrights, trademarks and patents, and to have accepted every one which has been strongly recommended by some physician would not only have produced hopeless confusion, but a new revision would have been necessary within a year." But even if the Committee of Revision had found it expedient to increase the admission of synthetics manifold, this would bring no relief to the pharmacist so long as physicians can be prevailed on to prescribe remedies of obscure origin and questionable composition. The pharmacist is looked to as the custodian and purveyor of these "specialties," and as such is expected to give information concerning them, which at best is given but imperfectly to the physician and usually not at all to the pharmacist. The influence which the exploitation of these "specialties" has exerted on

Modern Prescription-writing is very clearly demonstrated in a paper read by Dr. M. Clayton Thrush before the Philadelphia County Medical Society (published in "Alumni Report," April, 1905), which possesses more than ordinary interest, because of his very able analysis of 1,000 prescriptions, examined in equal numbers (500) as they were received and filed in each of two of Philadelphia's best prescription stores—managed by able and energetic pharmacists, who have had college training—and because their stores were so located that they received prescriptions from all the leading physicians of the city—a large number being from the pens of professors and instructors in the local medical schools and on the hospital staffs. The results of the author's investigations, which are discussed in detail are exhibited in the following table, all the prescriptions dating since January 1, 1904:

1000 Prescriptions.	Store No. 1.	Store No. 2.	Total expressed in percentage.
Number containing chemical incompatibilities	8	5	1.3
Number containing pharmaceutic incompatibilities	10	3	1.3
Number containing therapeutic incompatibilities	1	.....	0.1
Number containing six or more ingredients	34	16	5.0
Number containing two to five ingredients	347	371	71.8
Number containing one drug or preparation	119	113	23.2
Number containing only official preparations	244	240	48.4
Number containing proprietary preparations in whole or part	195	164	35.9
Number containing patent medicines	1	1	0.2
Number in which the metric system was employed	3	2	0.5
Number containing non-official preparations in whole or part	60	95	15.5
Number written correctly	328	293	62.1
Total prescriptions examined	500	500	100.0

The author's criticism in prescription-writing applies to the endings used in designating the drugs or preparations and the use of the proper official names as embodied in the inscription, and the proper phraseology as applicable to the prescription. As a rule, the prescriptions of the teaching class of practitioners were correctly written to a great extent, while those of some of the regular practitioners were carelessly written, and those of others showed a marked defect in the knowledge of prescription-writing. This was especially noticeable among the prescriptions of the more recent graduates. Less than two-thirds were correctly written, and this is largely due to the deficient training in this important subject in the average medical school. Looking for the causes of this deficiency it becomes evident that the lack of practical pharmaceutical information is chiefly responsible. The teacher is often a physician who has never received any pharmaceutical training other than the "smattering course" that he has received as a medical student, and, as a rule, he follows the same rut as his predecessor; as a consequence the pharmaceutical laboratory in its equipment (in medical colleges) is inadequate and very unattractive. Because of these facts, officers and trustees consider this branch of medicine unimportant, and the student, not realizing the value of a pharmaceutic training, completes the course ignorant of its many valuable points, and usually not until he reaches the senior year and commences to prescribe does he fully realize his deficiency in the knowledge of the mode of preparation, appearance, administration and effects of combining drugs, the very ammunition he is to use in firing his gun of knowledge to combat disease. It is not, however, until as a physician, authorized to use blank and pencil, and brought face to face with the

patient, that he most seriously and keenly feels the sting of his pharmaceutic ignorance; he tries to formulate a palatable mixture and fails, expects to find a nice, clear solution when he calls, only to find one with an unsightly and often dangerous precipitate. It is now after repeated failures that the horizon is filled with attractive-looking proprietary preparations, and these are substituted for the official drugs, because the label states that they are specific for the disease under consideration. As a result, this habit once established is continued through life.

On the basis of his investigation the author arrives at the following conclusions:

1. That the trend of modern prescription writing is in favor of proprietary preparations.

2. That the use of polypharmaceutic preparations is diminishing to a great extent, and their use is chiefly confined to the older practitioners.

3. That the number of incompatibilities observed is greater than it should be.

4. That the metric system is but little employed at the present time in prescription writing, a condition to be deplored.

5. That over one-third of the prescriptions are incorrectly written, and this is especially noticeable among the younger practitioners.

6. That certain non-official preparations are quite popular, and that some of these deserve admission to the United States Pharmacopœia.

7. That the more educated the physician the greater the use of the Pharmacopœial preparations, and the greater the tendency to simple instead of complex, non-scientific, polypharmaceutic and proprietary preparations.

Accepting Dr. Thrush's conclusions concerning the trend of the physician in his prescribing at the present time, it is gratifying to know that the medical profession has become aroused to the importance of finding relief from the promiscuous exploitation of "new remedies," which include the synthetical compounds as well as the so-called proprietaries and pharmaceutical specialties put out under trade-marked names—not, of course, for the relief of the pharmacist, but, in justice to themselves and their patients, to discourage and discountenance the exploitation and use on prescription or otherwise of all medicinal preparations whatsoever, the actual medicinally-active components of which, in kind and properties, are withheld by their manufacturers. With this object in view, a movement has been on foot during the past two years which has culminated in the organization, under the auspices of the American Medical Association, of a Council on Pharmacy and Chemistry. This Council is charged with the preparation of a book for publication by the Journal of the Association, which, under the title of

"*New and Non-Official Remedies*," shall give an authoritative description of such medicinal preparation as are offered to physicians and are not

included in the United States Pharmacopœia, or in other standard text-books or formularies, and shall conform to the standard established by the following ten rules:

Rule 1.—No article will be admitted unless its active medicinal ingredients and the amounts of such ingredients in a given quantity of the article be furnished for publication. The general composition of the vehicle, its alcoholic percentage, if any, and the identity of other preservatives, if present, must be furnished.

Rule 2.—No chemical compound will be admitted unless sufficient information be furnished regarding tests for identity, purity and strength, the rational formula and the structural formula, if known.

Rule 3.—No article that is advertised to the public will be admitted; but this rule will not apply to disinfectants and food preparations, except when advertised in an objectionable manner.

Rule 4.—No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to literature distributed solely to physicians, to advertising in medical journals, or to vaccines and antitoxins.)

Rule 5.—No article will be admitted or retained concerning which the manufacturer, or his agents, make false or misleading statements as to geographical source, raw material from which made, or method of collection or preparation.

Rule 6.—No article will be admitted or retained of which the manufacturer or his agents make unwarranted, exaggerated or misleading statements as to therapeutic value.

Rule 7.—Labels on articles containing "poisonous" or "potent" substances must show the amounts of each of such ingredients in a given quantity of the product. A list of such substances will be furnished.

Rule 8.—If the trade name of an article is not sufficiently descriptive of its chemical composition or pharmaceutical character, or is, for any other reason, objectionable, the Council reserves the right to include with the trade name a descriptive title in the book. Articles bearing objectionably suggestive names will be refused consideration.

Rule 9.—If the name of an article is registered, or the label copyrighted, the date of registration and a copy of the protected label should be furnished the Council. In case of registration in foreign countries, the name under which the article is registered should be supplied.

Rule 10.—If the article is patented—either process or product—the number and date of such patent or patents should be furnished.

These rules are declared to be "sufficiently liberal to permit the admission of all articles honestly made, ethically exploited, and worthy of patronage by intelligent physicians; but the Council disclaims the intent to

pass judgment on the therapeutics of any article admitted into the book." Its value being proportional to its completion, it is "proposed to be as liberal in approving articles for the book as is consistent with justice and equity to the public, to the manufacturing pharmacist and chemist, and to the physician."

Proceedings of the State Pharmaceutical Associations.

As usual, the information concerning the annual meetings of the State Pharmaceutical Associations has in the majority of cases been obtained from the reports appearing in the journals. The following abstracts pertain to the meetings held during the year 1904, the sources of information being indicated at the conclusion of each article.

Alabama.—The Twenty-third Annual Meeting of the Alabama Pharmaceutical Association was held at Mobile, April 19–21, 1904, in five sessions. J. D. Sutton, of Mobile, was elected President; W. E. Bingham, of Tuscaloosa, Secretary. The usual routine reports were received and discussed. An interesting letter from Thomas V. Wooten, Secretary of the N. A. R. D., was received and gave rise to an animated discussion, with the result that the Association unanimously adopted a series of resolutions endorsing the constructive and defensive work of the National Association so persistently conducted during the past five years of its existence. No papers were presented at this meeting. The next annual meeting will be held at Blount Springs, the day and date to be decided by the Executive Committee. (*From Proceedings.*)

Arkansas.—The Twenty-second Annual Meeting of the Arkansas Association of Pharmacists was held at Little Rock, May 10–13, 1904. R. B. King, of Helena, was re-elected President; Will C. Bond, of Little Rock, Secretary. J. B. Duble, representing the N. A. R. D., gave an interesting talk on "Organization," which was received with marked attention. The meeting is described as one of the most pleasant and profitable ever held by the Association. The next annual meeting will be held at Little Rock beginning on the second Tuesday in May, 1905. (*From Journals.*)

Connecticut.—The Twenty-eighth Annual Meeting of the Connecticut Pharmaceutical Association was held at Hartford on June 14, 1904, in three sessions. Richard H. Kimball, of Hartford, was elected President; Charles A. Rapelye, Secretary. The policy of the N. A. R. D. was endorsed. The following papers were read:

"Ointment of Mercuric Nitrate," by C. H. W. Newton.

"Chemism as a Molecular Force," by Geo. E. Bolles.

An interesting report on pharmacy and queries was presented by J. D. Hartigan. (*From Journals.*)

Delaware—The Eighteenth Annual Meeting of the Delaware Pharmaceutical Association was held at Wilmington on June 10, 1904. M. Morris

Stevenson, of Felton, was elected President; Frederick W. Fenn, of Wilmington, Secretary. The policy of the N. A. R. D. was endorsed, and resolutions were adopted endorsing the provisions contained in the Mann Bill. The next annual meeting will be held at Rehoboth in 1905. (*From Journals.*)

Florida.—The Florida Pharmaceutical Association was reorganized at Jacksonville, June 15, 1904. J. D. Abernathy, of Miami, was elected President; E. D. Damereaux, of Tampa, Secretary. (*From Journals.*)

Georgia.—The Twenty-ninth Annual Meeting of the Georgia Pharmaceutical Association was held at Augusta, May 17–18, 1904, in three sessions. James E. Kidd, of Milledgeville, was elected President; J. B. Riley, of Macon, Secretary. The report of Dr. George D. Case, Delegate to the N. A. R. D., endorsing the policy of the National Association, was adopted. The following papers were read:

"The Ingenuitive Druggist," by J. E. Kidd.

"Ten Reasons Why an Applicant for License should have Three Years Experience before Applying for Examination by the Board," by H. C. White.

"Paying, Practical, Legitimate Side-Lines for the Druggist," by J. E. Kidd.

"Every Druggist should Make His Own Most Popular Fluid-Extracts," by R. C. Wilson.

"Process for Causticless (Yet Antiseptic and Healing) Ointment of Carbolic Acid," by Sam. Bayne.

"Formula for a Light, Permanent Preparation of Cold Cream," by M. D. Hodges.

"A Volunteer Paper," by Mrs. Mallory H. Taylor.

The next annual meeting will be held at Columbus, May 23–24, 1905. —(*From Proceedings*).

Illinois.—The Twenty-fifth Annual Meeting of the Illinois Pharmaceutical Association was held at Rockford, June 13–15, 1904. Herman Fry, of Chicago, was elected President; R. N. Dodds, of Springfield, Secretary. This being the "Silver Anniversary" of the Association, the meeting was largely attended by druggists from all parts of the State, and much interest manifested in its proceedings. By resolution, the loyalty of the Association to the N. A. R. D. was re-affirmed. An interesting address was delivered on "The Relationship Between the Manufacturer and Legitimate Druggist," by Louis Kaminsky.

The next annual meeting will be held in Chicago, the time of the meeting to be determined by the officers of the Association. (*From Journals.*)

Indiana.—The Twenty-third Annual Meeting of the Indiana Pharmaceutical Association was held at Fort Wayne, June 1–2, 1904. C. E. Elliott, of Sheridan, was elected President; Arthur Timberlake, Indianapolis, Sec

retary. The N. A. R. D. and its legislative programme were endorsed. The following papers were read:

"The Clerk Problem," by J. W. Sturmer.

"Pharmaceutical Legislation," by J. N. Roe.

"Why I Write Prescriptions," by Dr. L. P. Drayer.

The next annual meeting will be held at Terre Haute.

—(*From Journals.*)

Indian Territory.—The Tenth Annual Session of the Indian Territory Pharmaceutical Association was held (in joint session with the Oklahoma Pharmaceutical Association) at Tulsa, I. T., May 9–11, 1904. Edward Shannahan, of Vinita, was elected President; H. D. Kniseley, of Chicotah, Secretary. The following papers were read in joint session:

"The Value of Local Associations," by John Wand.

"Duty of Clerks to their Employers," by C. M. Jones.

"Our Pharmacy Law When We Get Statehood," by B. F. Lillie.

"Practical Pharmacy Laws," by A. B. Clark.

The next annual meeting will be held at South McAlister in 1905.

—(*From Proceedings.*)

Kansas.—The Twenty-fifth Annual Meeting being the "Silver Anniversary," of the Kansas Pharmaceutical Association, was held at Leavenworth, May 24–26, 1904, in four sessions. John T. Moore, of Lawrence, was elected President; A. E. Topping, of Overbrook, Secretary. The association was briefly addressed by Dr. H. M. Whelpley, who spoke interestingly of the progress made in the work on the new Pharmacopœia, and on the educational features of special pharmaceutical interest that are presented at the World's Fair at the time being held in St. Louis. The following papers were read:

"What Can the A. Ph. A. do for the Future Pharmacist at Large, or Rather What Can Associations in General do for the Future Pharmacist," by Miss Dora C. Fisher.

"The Importance of Raising the Standards of Purity in Drugs and Chemicals," by Prof. Bailey.

"The Pharmacy Annual of Kansas University and the Program of the Kansas Pharmaceutical Association's Silver Jubilee," by W. S. Wilson.

"Taraxacum," by L. D. Havenhill.

"Economy in Indigenous Medicinal Plants," by L. E. Sayre.

"Licorice," by Walter Reese and L. E. Sayre.

The next annual meeting will be held at Eureka Lake, May 23–25, 1905.

—(*From Proceedings.*)

Kentucky.—The Twenty-seventh Annual Meeting of the Kentucky Pharmaceutical Association was held at Mammoth Cave, June 21–23, 1904, in three sessions. R. C. Stockton, of Richmond, was elected President, J. W. Gayle, of Frankfort, Secretary. The following papers were read:

"The Java Cinchonas," by Burr M. Overton.

"Criticism on the Miles Plan and Suggestion for One Better to Control the Cut-Rate Evil," by Simon N. Jones.

"How to Make a Drug-Store Attractive and Advertise Side-Lines," by W. H. Watson.

"The Injustice of Our Patent Laws Governing the Import of German Chemicals—Its Effect upon the Retail Druggist and the Laity," by Simon N. Jones.

"Our Pharmacy Law, Its Good and Bad Points, With Suggestions for Improvement," by Addison Dimmitt.

"Self Dispensing by Physicians from a Pharmacists' Standpoint," by Addison Dimmitt.

"Quality Should be the First Consideration," by C. S. Porter.

"How to Train a Husband!" "Do Bachelors Require Careful Feeding?" "Should a Young Lady Accept her First Proposal?" by Miss Eleanor Diehl.

"Do Bachelors Require Careful Feeding?" by Miss Everett.

"How to Train a Husband!" two papers, by Mrs. Burr Overton and by Mrs. J. W. Gayle.

"Far from Home and No Money," by G. S. Hazard.

"Freaks on the Railroad;" "Love in a Cottage," by Geo. Budde.

"What Should a Druggist Know in Emergency Cases?"—papers—by Simon N. Jones, by Addison Dimmitt, and by C. S. Foster.

"Counter Prescribing," by Edward H. Meyer.

The next annual meeting of the Association will be held at a summer resort in Kentucky, to be selected, with date of meeting, by the Executive Committee. (*From Proceedings.*)

Louisiana.—The Twenty-second Annual Meeting of the Louisiana Pharmaceutical Association was held at New Orleans, May 3–5, 1904, in three sessions. F. C. Godbold, of New Orleans was elected President; G. W. McDuff, of New Orleans, Recording Secretary. The report of Committee on Adulterations showed that flavoring extracts, laudanum, etc., obtained at drug-stores were satisfactory, while of the same goods sold at grocery stores the reverse was true. The Association adopted a code of ethics presented by a special committee. J. B. Duble, the representative of the N. A. R. D., addressed the Association and solicited its affiliation and support, which at a subsequent session was unanimously decided by an affirmative vote, as was also the endorsement of the Mann Bill. (*From Journals.*)

Maine.—The Twenty-seventh Annual Meeting of the Maine Pharmaceutical Association was held at Portland, June 21–22, 1904. G. R. Wiley, of Bethel, was elected President; M. L. Porter, of Danforth, Secretary.

—(*From Journals.*)

Maryland.—The Twenty-second Annual Meeting of the Maryland Pharmaceutical Association was held at Mount Holly Inn, June 21–24,

1904, in five sessions. H. Lionel Meredith, of Hagerstown, was elected President; Owen C. Smith, of Baltimore, Secretary. Reports of more than unusual interest were presented by the Committee on Pharmacy, the Committee on Adulteration, and the Committee on Procter Memorial. The acceptance of the latter report carried with it a request to the American Pharmaceutical Association to formulate a plan for the collection of a suitable sum of money with which to erect a bronze monument to William Procter (the father of American Pharmacy) in the Smithsonian grounds at Washington, D. C., and the pledge of the support of the Maryland Association in favor of the monument fund. The following papers were read:

"The Dispensatory of 1805, as Compared with That of the Present Day," by Franz Naylor.

"Some Uses of Paraffin," by J. J. Barnett.

"Adulterated Beeswax," by H. A. B. Dunning.

"Resin of Jalap," by E. F. Kelly.

"Fowler's Solution," by Claude D. Hickman.

"Pharmaceutical Journals," by H. P. Hynson.

"Salol, Tolu and Silver Coatings of Pills," by H. A. B. Dunning.

A communication was received from Secretary Thos. V. Wooten, setting forth the aims and the work accomplished by the N. A. R. D. during the five and a half years of its existence, and inviting the endorsement and coöperation of the Maryland Association. After mature deliberation, this endorsement was voted in a series of resolutions covering all the points presented in Mr. Wooten's letter. The next annual meeting of the Association will be held at Betterton, June 20–23, 1905. (*From Proceedings.*)

Massachusetts.—The Twenty-third Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Nantasket Beach, June 21–23, 1904, in four sessions. E. H. LaPierre, of Cambridge, was elected President; James F. Guerin, of Worcester, Permanent Secretary. The report of the Committee on Adulterations and Sophistication presented a long list of drugs, exhibiting the number of each that had been examined by the committee, and the number that had been found more or less adulterated. In three instances only all the specimens of the same drug were found free from adulterants; in the others they varied from 0.1 to as much as 100 per cent., the latter, of course, absolute sophistications, the average 1124 specimens examined being 43.4 per cent. Besides these, the report contains the analytical data, obtained in the Analytical Laboratory of the Massachusetts College of Pharmacy in the examination of a large number of specimens of preparations and chemicals, not included in the first mentioned list, including Liquor Potassii Arsenitis, Liquor Sodæ Chloratæ, Liquor Acidi Arsenosi, Liquor Plumbi Subacetatis, Spiritus Ammonæ Aromaticus, Acidum Sulphuricum Aromaticum, Acidum Hypophosphorosum Dilutum, Acidum Hydrobromicum Dilutum, Calx Chlorata, and Ammonii Carbonas. The following paper was read:

"The Belated Pharmacopœia," by William F. Sawyer.

The next annual meeting of the Association will be held at Leominster (?) in 1905. (*From Proceedings.*)

Michigan.—The Twenty-second Annual Meeting of the Michigan State Pharmaceutical Association was held at Grand Rapids, August 9 and 10, 1904. W. A. Hill, of Detroit, was elected President; W. H. Burke, of Detroit, Secretary. Major J. B. Duble, representative of the N. A. R. D., made an address on the work that has been accomplished by the National Association. The report of the Committee on Adulteration, made by J. O. Schlotterbeck, showed that there was still a goodly number of drugs and preparations sold by Michigan druggists that did not comply with the requirements of the U. S. P. The following papers were read:

"Dispensing Notes," by W. A. Hall.

"Tooth Paste, Powder and Lotions," by W. C. Kirchgessner.

"Not it, But Something Just as Good," by ——— Lemen.

"The Desirability of Membership in the American Pharmaceutical Association," by W. A. Hall.

"On Educational Qualifications," by A. B. Prescott.

H. B. Mason presented a number of queries which were the topics of an animated discussion during one of the sessions. The next annual meeting will be held at Kalamazoo, in 1905. (*From Journals.*)

Minnesota.—The Twentieth Annual Meeting of the Minnesota State Pharmaceutical Association was held at Winona, June 21–23, 1904, in four sessions. A. C. Le Richeux, of Duluth, was elected President; Theo. F. Leeb, of Winona, Secretary. The report of the Committee on Adulterations enumerates a number of drugs which have been found on analysis to be adulterated, but the Committee express the opinion, based on extended experience in examining the great number of drugs that come up for investigation in the actual course of business, that the adulterations practiced at the present time are not as numerous as formerly. The following papers were read:

"The Pharmacist's Greatest Responsibility," by A. C. Le Richeux.

"Is the Modern Prescription Tending Toward the Specification of Proprietaries?" two papers, by A. J. Eckstein and by H. W. Rietzke.

"What Shall it Be—The Merchant Pharmacist or the Scientific Pharmacist?" two papers, by R. H. G. Netz and by C. T. Heller.

The next annual meeting of the Association will be held at Duluth.

—(*From Proceedings*).

Missouri.—The Twenty-sixth Annual Meeting of the Missouri Pharmaceutical Association was held at Pertle Springs (Warrensburg), June 14–17, 1904, in six sessions. Ed. G. Orear, of Maryville, was elected President; Dr. H. M. Whelpley, of St. Louis, Permanent Secretary. Resolutions were adopted endorsing the aims and work of the N. A. R. D. The following papers were read:

"The African Medicine Man," by J. F. Llewellyn.

"Expeditious Method for the Preparation of U. S. P. Syrup of Calcium Lactophosphate," by Francis Hemm.

"One Hundred Common Therapeutic Terms," by Dr. H. M. Whelpley.

"Elixir Terpin Hydrate with Wild Cherry and Combinations," by Francis Hemm.

"A Demonstration in Practical Pharmacy," by Chas. L. Wright.

"Indian Flint-work of Microscopic Interest," by Dr. H. M. Whelpley.

"The First Call and the First 'Missouri Pharmaceutical Association' Meeting," by Dr. H. M. Whelpley.

"Limits of Precision," by Dr. H. M. Whelpley.

"The Fumes of Phosphorus Examined with a Microscope by Leeuwenhoek in 1693," by Dr. H. M. Whelpley.

"Microscopic Notes for Students," by Dr. H. M. Whelpley.

"A Good Prescription," by Wm. Mittelbach.

"Where Our Profits have Declined and Why they Should Advance," by H. W. Servant.

"Radium," by Dr. H. M. Whelpley.

"Pharmaceutical Preparations Prepared by Pharmacists," by John P. Dow.

"The New Pharmacopœia," by Dr. H. M. Whelpley.

The next annual meeting of the Association will be held at Pertle Springs (Warrensburg), June 13–16, 1905. (*From Proceedings.*)

Nebraska—The Twenty-third Annual Meeting of the Nebraska State Pharmaceutical Association was held at Fremont, June 7–9, 1904, in four sessions. C. H. Wilson, of Humboldt, was elected President; Oscar P. Baumann, of Grand Island, Secretary. Mr. F. C. Vincent, representing the N. A. R. D., delivered an admirable address explaining the aims of the National Association and the work accomplished, and solicited the endorsement of the state association. This was done by the adoption of a series of resolutions prepared and submitted by the Executive Committee. The following papers were read:

"How Can a Wife Best Aid Her Husband in the Drug Business?" by Mrs. D. J. Fink.

"Advertising," by J. Earle Harper.

"Galenical Pharmacy," by R. H. Phillips.

"What Should We Demand of Our Apprentices?" by F. D. G. Walker.

"Purity Rather than Price Should be the Prime Consideration," by E. E. Cathcart.

"Profitable Side-Lines," by Geo. B. Christoph.

"System," by Chas. H. Merriam.

"Conventions and Evils Confronting Retail Druggists," by S. C. Wilson.

The next annual meeting of the Association will be held at York, June 6–8, 1905. (*From Proceedings.*)

New Hampshire.—The Thirty-first Annual Meeting of the New Hampshire Pharmaceutical Association was held at the Weirs, July 28–29, 1904. William D. Grace, of Portsmouth, was elected President; John H. Marshal, of Manchester, Secretary. It was voted that the Association affiliate with the N. A. R. D. The next annual meeting will be held at Plymouth, the date to be fixed by the executive committee. (*From Journals.*)

New Jersey.—The Thirty-fourth Annual Meeting of the New Jersey Pharmaceutical Association was held at Bernardsville, May 25–26, 1904, in 4 sessions. George M. Beringer, of Camden, was elected President; Frank C. Stutzlen, of Elizabeth, Secretary. The following papers were read:

"On the Detection of Adulterants in Some of the U. S. P. Fixed Oils", by P. E. Hommell.

"A Few Laboratory Notes on the Properties and Uses of Hydrogen Dioxide", by J. P. Remington, Jr.

"Formulas for Some Galenical Preparations of Three Vegetable Drugs (*Galega officinalis; Crataegus Oxyacantha*, Gartner; *Lachnanthes tinctoria*, Ell.) that Merit Further Medical Attention," by George M. Beringer.

"Linseed Oil and Its Adulterations," by Prof. H. J. Lohmann and E. A. Lenk.

"Estimation of Aloin in the Commercial Varieties of Aloes," by Herman J. Lohmann.

"What a Preceptor Owes his Apprentice," by Herman J. Lohmann.

"Sophistications and Adulterations in Various Quarters," by David Poe.

"Infusa and Decocta," by Henry Schmidt.

Resolutions were adopted reaffirming the moral support of the Association to the aims, and expressing confidence in the constructive and defensive work of the N. A. R. D., displayed during the past five years of its existence. The next annual meeting of the Association will be held at Atlantic City in 1905. (*From Proceedings.*)

New York.—The Twenty-sixth Annual Meeting of the New York State Pharmaceutical Association was held at Brighton Beach, June 27 to July 1, 1904, in six sessions, the last session being held on board of the steamer "Richmond." W. C. Anderson, of Brooklyn, was re elected President; S. V. B. Swann, of New York, Secretary. In response to a letter from the Secretary of the N. A. R. D., soliciting the endorsement and support of the Association to the work undertaken by the National Association, the Association by unanimous vote re-affirmed its loyalty, and agreed to remit its dues as heretofore. The Mann Bill was also endorsed. The following papers were read:

"Fire Insurance for Retail Druggists," by E. S. Dawson.

"Notes on Iodoform," by J. P. Remington, Jr.

"Official Methods of Analysis," by Joseph L. Mayer.

"Am I My Brother's Keeper," by A. B. Huested.

Mr. T. J. Keenan presented the report of the Committee on New Remedies, giving a list of the new preparations which have been introduced during the past year. The next annual meeting will be held at Saratoga, the date to be decided by the executive committee. (*From Journals.*)

North Carolina.—The Twenty-fifth Annual Meeting of the North Carolina Pharmaceutical Association was held at Asheville, July 14–15, 1904, in 4 sessions. G. K. Grantham, of Dunn, was elected President; P. W. Vaughan, of Durham, Secretary. Mr. Duble, representative of the N. A. R. D., addressed the Association at length, explaining the aims and the work accomplished by the National Association since its inauguration over five years ago. At the conclusion of this address the Association adopted a series of resolutions expressive of its confidence in the constructive and defensive work of the National Association and affirmation of its loyalty to that organization. The following papers were read:

"Five Reasons why Every Pharmacist in the State should be a Member of the North Carolina Pharmaceutical Association," by Wm. Niestlie.

"It has been Suggested that Congress Enact Legislation Requiring the Manufacturers of Patent Medicines to Print the Formulas of their Products upon the Package. Would such a Change be Desirable and Practicable?" by Wm. Niestlie.

The next annual meeting of the Association will be held at New Bern in 1905. (*From Proceedings.*)

North Dakota.—The Nineteenth Annual Meeting of the North Dakota Pharmaceutical Association was held at Grand Forks, August 2–4, 1904, in four sessions. W. J. Camden, of Walhalla, was elected President; W. S. Parker, of Lisbon, Secretary and Treasurer. An address was delivered by Major Vincent, the representative of N. A. R. D., explaining the aims, work and needs of the National Association, and in response the Association adopted resolutions of confidence and loyalty to that body. The business of the Association was merely of routine character. The next annual meeting will be held at Fargo, August 8, 1905.

—(*From Proceedings*).

Ohio.—The Twenty-sixth Annual Meeting of the Ohio State Pharmaceutical Association was held at Cincinnati, June 7–10, 1904, in five sessions. John Byrne, of Columbus, was elected President; Theo. D. Wetterstroem, of Cincinnati, Permanent Secretary. A number of highly interesting addresses were delivered during this meeting on the following topics:

"What the American Pharmaceutical Association has Accomplished in Fifty Years," by J. H. Beal.

"What the American Pharmaceutical Association is Doing at the Present Time for Pharmacists," by G. B. Kauffman.

"On the Future of Pharmacy by the American Pharmaceutical Association," by J. U. Lloyd.

"On the Membership in the American Pharmaceutical Association from Ohio," by H. V. Arny.

"The Ohio Food Commission," was the subject of an address by Commissioner Horace Aukeney, and the "Work of the N. A. R. D." was elucidated by the address by J. H. Duble, the official representative of that Association. In response to the latter, a series of resolutions endorsing the work of the National Association and expressive of continued loyalty to that body were adopted without dissent. The following papers were read.

"The Status of Pharmacy," by Wm. Kaemmerer.

"The Old and New Poison Laws," by J. H. Beal.

"Contributions Toward a History of Pharmacy in Ohio—Notes on Early Drug Stores in Cleveland," by Joseph Feil.

The Committee on Adulterations made a valuable report, supplemented by special reports on "Tincture of Opium" (by F. L. Fickardt) and on "Fixed Oils" (by Theo. D. Wetterstroem). The next annual meeting of the Association will be held at a time and place to be determined by a committee nominated for this purpose. (*From Proceedings.*)

Oklahoma.—The Fourteenth Annual Session of the Oklohoma Pharmaceutical Association was held (in joint session with the Indian Territory Pharmaceutical Association) at Tulsa, I. T., May 9–11, 1904. At a private session, May 10, 1904, J. M. Remington, of Shawnee, was elected President; F. M. Weaver, Oklahoma City, Secretary. The papers presented by members of this Association were read in joint session with the Indian Territory Pharmaceutical Association (which see). The next annual meeting will be held at Shawnee, on the second Tuesday in May, 1905.

—(*From Proceedings*).

Pennsylvania.—The Twenty-seventh Annual Meeting of the Pennsylvania Pharmaceutical Association was held at Cambridge Springs (Crawford County), June 21–23, 1904, in seven sessions. Julius A. Koch, of Pittsburg, was elected President; Jacob A. Miller, of Harrisburg, Secretary. Interesting reports were received from the Committee on Adulteration and the Committee on Botany. The N. A. R. D., through its Secretary Thos. V. Wooten, addressed a circular letter to the President of the Association, which was referred by the latter to the Association for consideration with the recommendation that a series of resolutions accompanying the letter, approving the work of the National Association during the past five years and re-affirming its loyalty to the latter, be adopted. This was done without dissent. The following papers were read:

"What is the Cause of the Popularity of Carbolic Acid as a Means of Committing Suicide?" by Louis Emanuel.

"The Butler Fever Epidemic as Seen by a Local Druggist," by C. N. Boyd.

"A Prerequisite Law," three papers, by Joseph P. Remington, by P. H. Utech, and by H. B. Foresman.

"In these Times with Emergencies in the Hands of all Physicians, is there any Necessity of Drug Stores being Kept Open on Sunday and So Late at Night," by J. H. Redsecker.

"The Ideal Suppository," by Charles E. Vanderkleed.

"On Aniline Colors and Salicylic Acid in Articles of Food and Drink, and How they may be Detected," by Charles H. La Wall.

"Some Laboratory Notes" (volumetric estimation of phenol, and starch indicator), by Frank X. Moerk.

"Mental Myopia," by B. E. Pritchard.

"Directories for Nurses," by L. L. Walton.

"Priestley as a Prophet," by Charles H. La Wall.

"Analytical Data Obtained in the Examination of Various Drugs" (yellow and red cinchona, saffron, oil of rose, olive and cappock oils), by Willard Graham.

"Essentials and Mediums of Advertising," three papers, by Fred. S. Nagle, by John R. Thompson, and by James S. Gleghorn.

"Prescribing Proprietary Remedies," by Clement B. Lowe.

"Citrine Ointment," by ——— ——— (read by J. H. Redsecker).

"On the Use of Talcum in the Preparation of Aromatic Waters," by J. P. Remington, Jr.

"On African Balsam," by C. M. Kline.

"On the Sweating of Show Windows and Its Prevention," two papers, by H. F. Ruhl and by C. F. King.

"Profitable Preparations of Petroleum Products," by Frederick E. Niece.

"The Traveling Salesman," by W. O. Skelton.

"Detection of Formaldehyde," by Albert F. Judd.

"What Advantage Would an Annual License for an Individual and Location of Drug Stores Have Over the Present Method?" by Louis Emanuel.

The next annual meeting of the Association will be held at Bedford Springs Hotel (Bedford), June 20–23, 1905. (*From Proceedings.*)

South Carolina.—The Twenty-eighth Annual Meeting of the South Carolina Pharmaceutical Association was held at the Isle of Palms (near Charleston), June 28–29, 1904, in two sessions. J. C. Mace, of Marion, was elected President; Frank M. Smith, of Charleston, Secretary and Treasurer. (*From Journals.*)

Tennessee.—The Nineteenth Annual Meeting of the Tennessee Pharmaceutical Association was held at Lookout Mountain, July 20–22, 1904, in 3 sessions. R. W. Vickers, of Murfreesboro was elected President, E. F. Trollinger, of Bell Buckle, Secretary, J. B. Duble, representative of the N. A. R. D. addressed the Association (this address is not reported in the

printed proceedings). A series of resolutions, endorsing the work of the N. A. R. D., was reported unanimously adopted. The following papers were read :

"Practical Suggestions on Business Side of Pharmacy," by Samuel C. Davis.

"What are the Best Methods of Advertising that can be Adopted by the Retail Druggists ?" by W. H. Watson.

"The Benefit and Advantages of the Traveling Man to the Profession," by S. F. Knott.

"Is the Soda Fountain Profitable and How to Make it More so ?" by M. E. Hutton.

"The Advantage or Disadvantage of the Metric System," by Egbert W. Holcombe.

The next Annual Meeting of the Association will be held at Bon Aqua Springs, the third Wednesday in July, 1905. (*From Proceedings.*)

Vermont.—The Eleventh Annual Meeting of the Vermont State Phamaceutical Association was held at Burlington, October 11–12, 1904, in three sessions. F. Henry Parker, of Burlington, was elected President ; W. E. Terrill, of Montpelier, Secretary. The Association, after an address by Mr. Hoffman, the representative of the N. A. R. D., voted to re-affiliate with the National Association. No papers were read, and the business transacted was of a routine character. The next Annual Meeting of the Association will be held at Burlington on July 12–13, 1905. (*From Proceedings.*)

Texas.—The Twenty-fifth Annual Meeuing of the Texas Pharmaceutical Association was held at Houston, May 17–18, 1904, in three sessions. J. J. Thames, of Taylor, was re-elected President ; R. E. Walker, of Gonzales, Secretary and Treasurer. J. B. Duble addressed the Association in behalf of the N. A. R. D., inviting affiliation and offering a series of resolutions endorsing the work of the National Association. By a very close vote these resolutions were defeated, and the Texas Association refused to affiiliate. The following papers were read :

"On a New Method of Preparing Deodorized Tincture of Opium," by A. E. Schaeffer.

"Is it Necessary for the Retail Druggist to be a Practical Pharmacist to Make a Success in His Business?" by ——?

"On the Legislative Demands of the Pharmaceutic Profession and the Importance of Elevating It to the Highest Standard," by Prof. R. R. D. Cline.

The next annual meeting will be held at Fort Worth. (*From Journals.*)

Virginia.—The Twenty-third Annual Meeting of the Virginia Pharmaceutical Association was held at Buckroe Beach, July 12–14, 1904. T. A. Miller, of Richmond, was elected President ; C. B. Fleet, of Lynchburg,

Secretary. The place and time for the next meeting is to be decided by a committee of which H. W. Martin is chairman. (*From Journals.*)

Washington.—The Washington State Pharmaceutical Association held its Fifteenth Annual Meeting (as it did its Fourteenth) on board of the steamer "Queen," sailing around Puget Sound, July 12–16, 1904. W. R. Pratt, of Everett, was elected President; W. T. Browning, of Tacoma, Secretary. (*From Journals.*)

Wisconsin.—The Twenty-fourth Annual Meeting of the Wisconsin Pharmaceutical Asssociation was held at Fond Du Lac, August 2–4, 1904, in 5 sessions. F. H. Spence, of La Crosse, was elected President; Henry Rollmann, of Chilton, Secretary. Mr. J. R. Duble, the representative of the N. A. R. D., addressed the Association and presented a series of resolutions endorsing the work of the National Association for adoption. These resolutions appear supplementary to the minutes of the meeting, in the printed proceedings, but there appears no record of their adoption. The following papers were read:

"How Can a Druggist Increase the Soda Water Trade, and Should the Evil of Five-Cent Ice Cream Sodas Exist? The Best Plan by Which He Can Obtain Ten Cents," by C. J. Sacksteder.

"What Benefit is to be Derived From an Organization of Local Druggists?" by E. W. Sacksteder.

"How Best to Advertise the Wisconsin Pharmacal Companies' Preparations," by J. C. Long.

The next annual meeting will be held at Madison, July 11–14, 1905.

—(*From Proceedings.*)

PHARMACY.

A. Apparatus and Manipulations.

Metric System of Weights and Measures—Some of the Advantages of its Adoption.—Egbert W. Holcombe in a concise manner presents some of the advantages of the Metric System of Weights and Measures in contrast, particularly, with the systems in use in England and still favored in the United States by the majority of pharmacists. He says, we have two different sized pounds, two different sized gallons, and at least two different sized ounces. His arguments in favor of the metric system are the following: Simplicity—you learn one table and you have learned them all; ten millimeters make one centimeter, ten centimeters make one decimeter, ten decimeters make one meter, ten meters make one dekameter, ten dekameters make one hectometer, and so on, all the tables are alike except the unit of measurement; its universality—all the nations of the globe use

it, the same table is used whether you wish to measure the distance to a star, or the size of a microbe; whether you wish to determine the weight of the earth, or the cubic centimeter of one of its gases; its necessity—every druggist, if he keeps up with his business, must know something of the metric system. Why not make it a part of his professional knowledge and use it whenever he can? The whole system can be learned in one hour's time, so as to be remembered.—Proc. Tenn. Pharm. Assoc., 1904, 52–54.

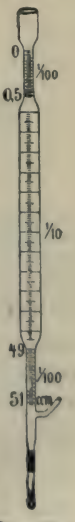
New Liter Flask—Convenient Form for Preparing Volumetric Solutions.—In preparing normal solutions it is frequently found very convenient in standardizing the solutions to empty the contents of a flask into a measuring cylinder, or to perhaps remove 100 Cc. with a pipette. In the latter case, in fact, an extra liter flask must be used in order to dilute the liquid again. In order to avoid this inconvenience, A. Goske has devised a liter flask which is illustrated by Fig. 1. As shown, the neck of the flask is somewhat prolonged, and graduated from 1000 Cc. down to 920 Cc. This arrangement permits any quantity of liquid to be removed readily, and the balance made up to volume at the temperature at which the apparatus has been graduated.—Merck's Report, Nov., 1904, 330; from Apoth. Ztg., xix (1904), 721.

FIG. 1.

Liter Flask.

New Burette—Special Construction for Standardizing Normal Solutions.—A. Hesse has constructed the burette shown by Fig. 2, which facilitates the accurate standardization of normal test solution. The upper constricted part of the burette, having a capacity of 0.5 Cc., is divided into $\frac{1}{100}$ Cc., the next following main portion, as usual, into $\frac{1}{10}$ Cc., and the lower constricted portion again in $\frac{1}{100}$ Cc. for a distance of 2 Cc. (from the 49 to 51 Cc. mark). These graduations enable the practically absolute measurement of the solutions required when it is known that the total volume required for a titration reaches to within the limit of the constricted lower portion (to between 49 and 51 Cc.), this having previously been ascertained experimentally. The upper constricted portion is surmounted by a cup-shaped expansion, to prevent overflow in case the liquid is allowed to enter too rapidly by the sudden opening of the inflow cock.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1105; from Chem. Ztg., 1904, No. 98.

FIG. 2.

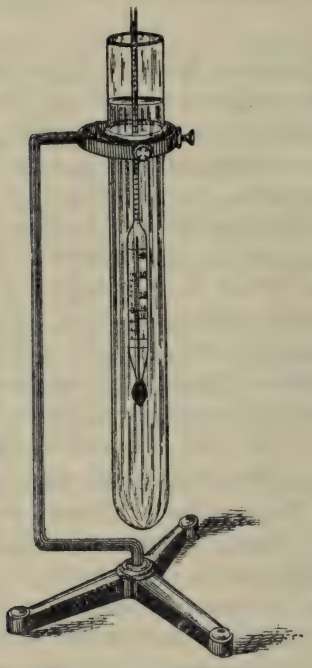


Burette.

Hydrometer Cylinder—A Form Held in Position by Free Suspension.—S. Hayck constructs and supplies the hydrometer glass shown by Fig. 3, which presents the practical and desirable advantage of uniformly main-

taining a vertical position, independent of the surface on which it is placed, and thus secures a true vertical position of the immersed instrument and avoids its contact with the inner walls of the glass. This is accomplished by suspending the glass after the manner of suspending a ship's compass. By means of a thick glass flange, it rests upon a ring,

FIG. 3.



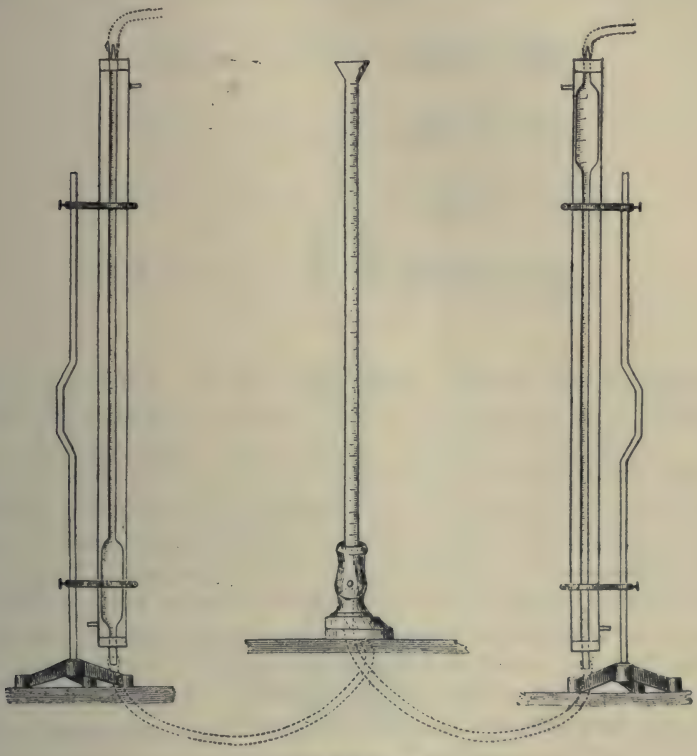
Hydrometer Cylinder.

attached by two bolts which turn freely in sockets, and are fitted into a metallic outer ring, which is rigidly attached by the aid of a set-screw to a stand of sufficient height and dimensions. These, in conformity with the German excise regulations, are 500 Mm. internal height and 50 Mm. inner diameter, but smaller forms are also constructed and supplied.—Pharm. Ztg., *50*, No. 28 (April 5, 1905), 294.

Gas Burettes—Improved Form for Delicate Readings.—Inasmuch as the usual form of gas burettes do not permit readings of less than 0.1 Cc., and that on account of the small quantities of the gas generated possible errors in the readings are greatly multiplied, J. Zrzawy has modified their construction as shown in the accompanying cut (Fig. 4). They consist of a wide cylindrical part having a capacity of 75 Cc. to which a long, narrow tube of 25 Cc. capacity, and graduated so that it becomes possible to make readings as small as 0.01 Cc. with accuracy, is attached. The entire measuring tube is enclosed, as is customary, with a water-jacket and united

with the usual leveling-tube. A second burette may be joined to this leveling-tube, if desired, the one being graduated from 0 to 25 Cc., the other from

FIG. 4.



Gas Burettes.

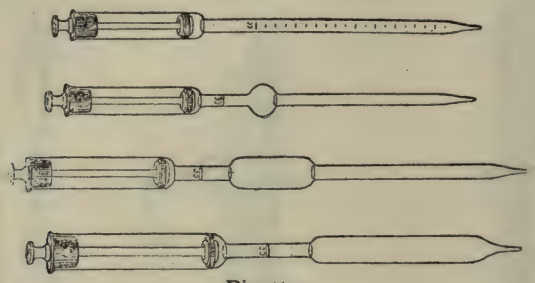
75 to 100 Cc. This arrangement has been found very serviceable in practice, and the operations are no more inconvenient than when the ordinary form of gas burettes is employed.—Pharm. Ztg., *50*, No. 16 (Febr. 25, 1905), 167; from Chem. Ztg., 1904, No. 98.

Pipettes—Construction with Suction Pumps.—A French firm has introduced the pipettes, provided with suction pumps, shown in various forms by Fig. 5, which possess the advantage over the ordinary forms, provided with a compressible rubber bulb, that the liquid can with perfect ease be drawn up to the desired point on the scale, and with absolute accuracy maintained at the same height as long as may be desired.—Pharm. Ztg., *50*, No. 37 (May 10, 1905), 389; from Bull. de Sc. Pharm., 1905, No. 4.

Eye Dropper—Proposed Standard.—Dr. P. N. K. Schwenck, Surgeon to Wills' Eye Hospital, speaking of the size of the dropper as applied to eye drops containing alkaloids, says there is little doubt but that all occu-

lists accept one minim as the unit of measure, that one drop should be its equivalent, and that they consequently intend that the pharmacist will give a dropper that will drop just that quantity. From a number of trials he

FIG. 5.



Pipettes.

has found a dropper having a straight tip 2.00 to 3.5 Mm. in diameter, when held at an inclination of 45°, will produce 60 drops to the (fluid) dram. The dropper should have a black or dark rubber nipple (not red or white), and the nipples should always be cleaned to rid them of dust or sulphur contained in them. In this connection some interesting observations were made by Dr. Wendel Reber, and by Mr. M. I. Wilbert, the latter calling attention to the fact that the International Conference for the Unification of the Formulæ of Patent Medicaments, held at Brussels, Belgium, in 1902, recommended the adoption of *a normal drop counter*, having an external dropping surface of 3 Mm., and dropping, at 15° C., drops that will weigh 0.05, or the equivalent of $\frac{1}{20}$ of 1 Cc.; and that this recommendation has been officially adopted by every country represented at the Conference, with the exception of Germany and the United States.—Amer. Journ. Pharm., March, 1905, 123–128.

Filtration—Device for Acceleration.—W. Emmerich has constructed the device shown by Fig. 6 which when attached to an ordinary funnel tube, being somewhat constricted in the ends forming the S-shaped portion inpresses numerous air bubbles in the column, and then produces the effect of a suction pump, greatly accelerating the flow of filtrate. The device is also constructed with several S-shaped bends, resulting in greatly augmenting suction.—Pharm. Ztg., *50*, No. 37 (May 10, 1905), 389.

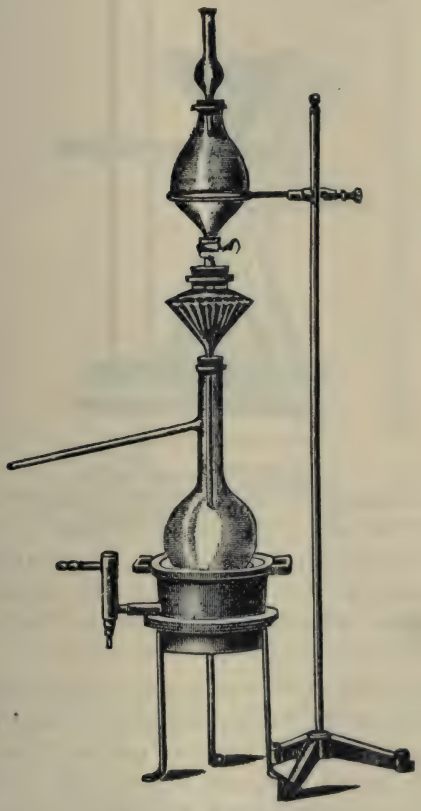
FIG. 6.

Filtration Device.

Vacuum Filtration—Convenient Devices.—W. Pip has devised the funnel of novel construction shown in the accompanying cut (Fig. 7) which, in connection with the apparatus usually found in experimental laboratories, permits the simultaneous filtration and evaporation of liquids under exclusion of air, or under reduced pressure. The long-stemmed

funnel is constricted upwards from its widest diameter so as to form a tubulure, sufficiently wide to facilitate the introduction of a pleated filter, and narrow enough to permit the insertion of a perforated rubber stopper bearing an ordinary separatory funnel, while the long stem of the new funnel

FIG. 7.



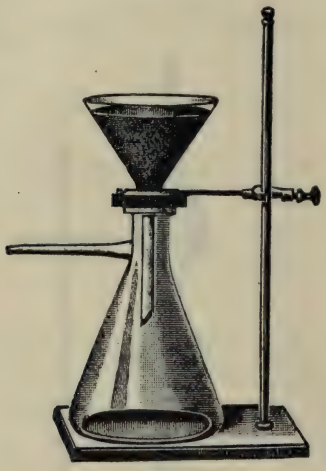
Vacuum Filtration.

conveniently reaches the interior of a fractionation flask of the usual form, or an ordinary suction flask.

A simple arrangement, suitable for vacuum filtrations and permitting the use of funnels of ordinary construction, is also shown by Fig. 8. It consists in closing the mouth of a suction flask with a circular disc of pure rubber, having a central opening into which the funnel is inserted. The funnel having been charged with the liquid to be filtered and suction applied, a vacuum is established and the disc forms an air-tight joint with the flat-edged mouth of the flask.—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 783–784; from Chem. Ztg., 1904, No. 70.

Hot Filtration—A Practical Device.—Giemsa calls attention to a device which, although not original, is new in its application to the rapid filtration of hot liquids in glass funnels, permitting the use of thin-walled funnels in

FIG. 8.



Vacuum Filtration.

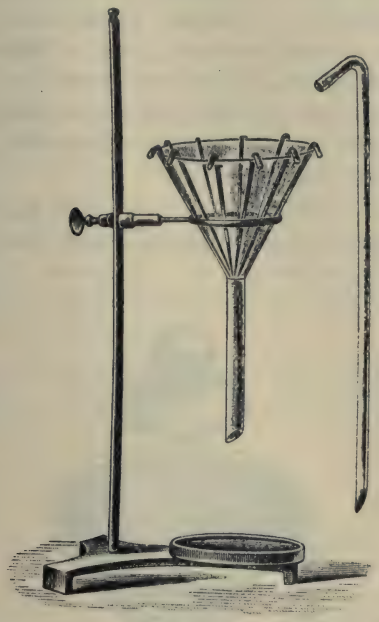
place of the ribbed funnels generally used for this purpose, which are liable to be fractured by the heat. The device consists of a number of glass rods, shaped and arranged as shown in the accompanying cut (Fig. 9), which is self-explanatory. Obviously, these rods may also be used with advantage in porcelain or metal funnels.—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 783.

New Filter Tube—Practical Construction.—H. P. Mason has designed the filter tube shown by Fig. 10, for filtrations through paper pulp or asbestos in metallurgical analyses. The new feature is that the stem is separate from the body of the tube, and is ground in, so that it is held in position and forms a ledge on which a porcelain filter-disc can rest. A filter is prepared by closing the stem orifice with a finger and half filling the tube with water to displace the air; the disc is introduced and the filtering medium poured in; the water is then allowed to flow out, and the filter made of the desired texture by means of a flat-headed glass rod. When filtration is completed the stem is loosened and raised slightly, when it empties itself of wash-water, and, being slightly longer than the tube body, it can be used to eject the filter, which, in its passage down the tube, effectually removes and carries with it any particles adhering to the sides.—Chem. News, April 20, 1905, 181.

Asbestos Filters—Water-soluble Constituents.—Karl Windisch directs attention to the necessity of testing asbestos before using it for filtering in

analytical operations, even that supplied for this purpose being often contaminated with substances soluble in water. Ten samples examined by the author yielded in hot water quantities of substance amounting in some

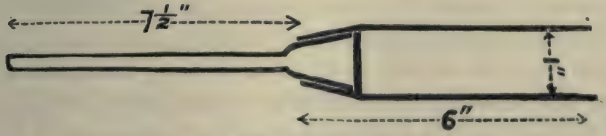
FIG. 9.



Hot Filtration.

cases to 11 per cent., and among them some that produced alkaline solutions of greater or less strength. Thus, in the examination of wines, for instance, the percentage of apparent extract may be increased and the acidity reduced by 1 or 2 per cent.; the ash may be increased by 0.015

FIG. 10.



New Filter Tube.

to 0.068 Gm. from 100 Cc., and may also show greater alkalinity.—Pharm. Ztg., *49*, No. 105 (Dec. 31, 1904), 1115; from Wschr. f. Brauerei, *21*, 547.

Paper Pulp—Practical Experience with it as a Filtering Medium.—After trying various methods of filtration, including force filtration by the use of the filter pump, to facilitate the clarification of a liquid containing

pepsin and glycerin, H. A. B. Dunning tried the following plan: Several sheets of large filter paper were allowed to soak in water for several hours, after which they were stirred and beaten into a fine pulp. A large pledget of absorbent cotton having been placed in and over the orifice of a two-gallon percolator, the paper pulp mixed with water was poured in. After the water had drained off, the pulp was leveled down by jarring, but not pressed. This was covered over with a piece of filter paper and several glass bottle tops, and the cloudy liquid was poured on. All the water having been pressed out and removed, the solution came through perfectly clean and quite rapidly five gallons being collected in a reasonable length of time.—Drugg. Circ., Feb., 1905, 45.

Straining Funnel—A Useful Device.—Wolsiffer has secured a German patent on the compact straining apparatus shown by Fig. 11 which re-

FIG. 11.

Straining Funnel.

quires little discription. It consists of a shallow aluminum funnel in form of a truncate cone from which a short wide neck, provided with a screw thread, extends downward. This is closed by a perforated screw cap into which a disk of straining material—muslin, gauze, flannel and the like—is placed when the strainer is to be used, being held securely in place by a slight inward curve of the extremity of the neck. A short pestle is provided for pressing the solid substance from which the fluid is to be separated, for instance in the preparation of infusium, or tinctures by maceration.—Pharm. Ztg., *49*, No. 102 (Dec 21, 1904), 1086.

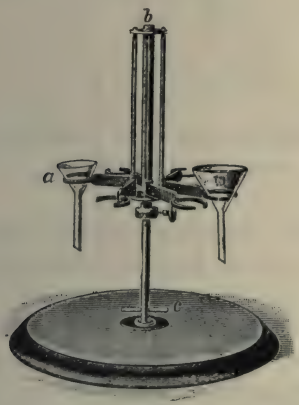
Separable Rubber Straining Funnels—Convenience in Prescription Work.—In the course of some practical observations concerning straining as applied to prescription work, W. A. Dawson calls attention to the little hard rubber separable funnel sold by "druggists' sundries" houses as being well-nigh indispensable for use at the prescription counter. For strain-

ing through muslin there is no other contrivance by which one can strain a small amount of liquid—up to eight ounces—so quickly and efficiently. As the muslin is tightly stretched, diaphragm-like, between the upper and lower part of the funnel and the meshes of the cloth held open, there is no more lateral motion than in a sieve cloth; it is, in fact a miniature sieve, and it is possible to rub through it a bismuth mixture, or other insoluble substance suspended in a liquid, or to smooth out a clotty mixture, or break up a recalcitrant precipitate when it is impossible to do so in the mortar. Small patches of straining cloth of various mesh and texture should be kept at hand ready to insert in the funnel, without having to stop and cut or tear off a piece from the roll.—Drugg. Circ., Oct., 1904, 222; from Proc. N. Y. State Pharm. Assoc., 1904.

Gauze for Straining Funnels is suggested by H. A. B. Dunning to be kept ready clipped, in squares of about three inches, which fit in the usual guttapercha sectional straining funnel. Each square of gauze is thrown away after use.—*Ibid.*, Feb., 1905, 44.

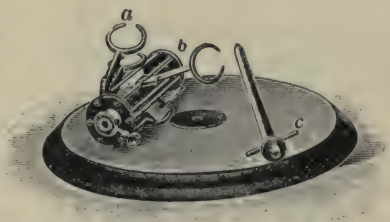
Filter Stand—Improved and Portable Form—G. Iliovici has devised the filter stand shown by Figs. 12 and 13, which possesses, among other

FIG. 12.



Improved Filter Stand.

FIG. 13.



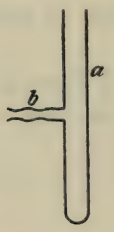
Portable Filter Stand.

advantages, compactness and portability. A central rod *c* carries a tube *b* sliding over it, and adjustable to the desirable height by means of a set screw. The sliding tube *b* is surrounded by six small rods, which are fixed in this position, each carrying a funnel-holder *a*, hinged in such manner that when in a horizontal position for the reception of the funnel, the holder rigidly maintains its position, while by slightly raising the holder out of the horizontal plane, the impact against the rod is released and the holder may be raised or lowered as required. When not in use the holder may be folded compactly against the individual rods, and the several parts

of the stand reduced to a conveniently portable compass, as shown by Fig. 13.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 898; from Ztschr. f. anal. Chem., 1904, *43*, No. 8.

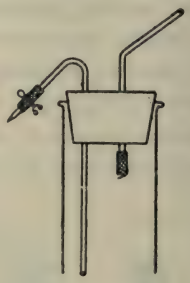
Separating Tube—A Useful Contrivance for Small Operations.—R. Doht recommends the tube-separator, (shown by Fig. 14), for shaking out small quantities of liquids with ether, benzol, etc. The tube, *a*, is filled up to the small lateral tube, *b*, with the liquid to be shaken out, and, the lateral tube being closed with the middle finger of the hand holding it, the tube *a* is filled with the shaking-out fluid, closed with one of the thumbs, and shaken. After subsidence, the upper fluid is withdrawn by

FIG. 14.



Separating Tube.

FIG. 15.



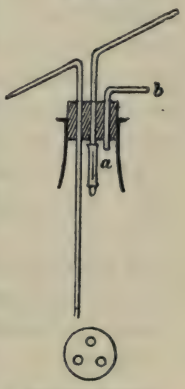
Spritz-Bottle.

removing the fingers carefully, and the operation may then be repeated. —Pharm. Ztg., *50*, No. 28 (April 5, 1905), 294; from Chem. Ztg., 1905, No. 23.

Spritz-Bottle—Improvement to Secure and Maintain Pressure.—Rickl describes an improvement of the spritz-bottle of ordinary construction whereby it is possible to secure and maintain the pressure obtained by blowing into the mouthpiece. As shown in the cut (Fig. 15), the cylindrical rubber-bulb of an ordinary eye-dropper, with a flat apex, cut with a sharp knife to ⅔ its diameter so as to form a valve, is slipped over the interior end of the mouthpiece, while a section of rubber tubing bearing a pinch-cock and a short glass tube drawn out to a pointed extremity, is attached to the outflow tube. In use, air is blown into the spritz-bottle as usual, the pinch-cock being opened. The pressure thus created is sufficient to maintain the flow for some time after the mouth has been removed; or, if the outflow is intercepted by closing the pinch-cock, it will continue for some time without the necessity of continually blowing into the bottle. Instead of a dropper-bulb, a section of rubber tubing, closed at its nether end and provided with a short slit, cut with a sharp knife may be used; but this necessitates more forcible blowing, which the improvement is intended to avoid.—Pharm. Ztg., *49*, No. 53 (July 2, 1904), 556.

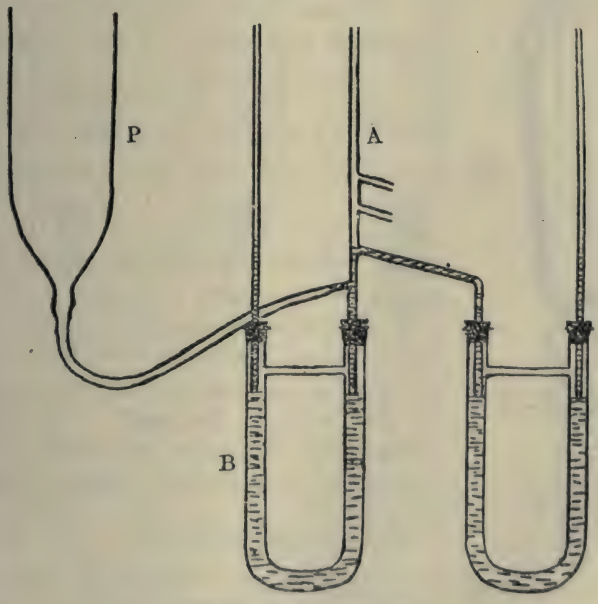
Spritz-Bottle—Efficient Construction.—Numerous modifications of the spritz-bottle have been proposed in recent years, intended mainly to secure a constant flow of liquid with the least possible tax upon the lungs of the operator blowing into the mouthpiece. Some of the proposed modifications are too complicated for general adoption, while others are too expensive or are not conveniently constructed by the operator. Th. Knösel therefore calls attention to a form long ago suggested by Hartmann, which, as modified, serves the purpose admirably and is easily constructed with ordinary laboratory facilities. As shown by Fig. 16, the interior end of the mouthpiece is closed with a valve, *a*, made by attaching a short section of rubber tube, into which a longitudinal incision is made with a sharp knife, while the extremity is closed with a small glass rod or stopper. This permits the entry of air by pressure from without, while the pressure created in the interior closes the valve effectually, any pressure produced by blowing into the mouthpiece being maintained as long as the orifice of the short tube, *b*, is kept closed with the thumb of the hand holding the flask, or

FIG. 16.



Spritz-Bottle.

FIG. 17.



Percolation Apparatus.

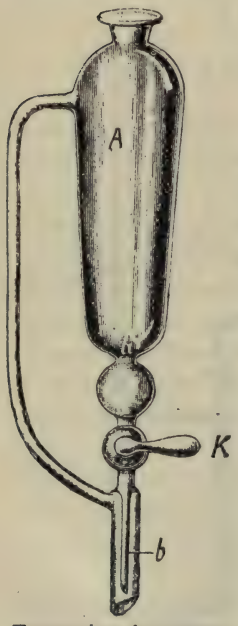
until it has been reduced by the escape of liquid during use. By inverting the flask the contents may be poured out through the tube *b* instead of

through the mouthpiece, as is necessary in the older forms of spritz-bottle.

Percolation—Apparatus for Collecting Percolate in Fractions.—Professor Greenish has devised the apparatus shown by Fig. 17, which Elsie S. Hooper finds very useful for collecting percolates in fractions. It consists essentially of a long piece of thick-walled, narrow glass tubing with side tubes fused in at intervals of about one inch (*A*). This is fitted, air-tight, into one limb of a U-tube (*B*) by means of a rubber stopper; the other limb is also fitted, in the same way, with a piece of glass tubing to serve as a pressure tube. The two limbs of the U-tube are connected by a cross-bar, so as to equalize the pressure. Rubber tubing from the orifice of the percolator (*P*) is connected to the lowest side tube, as shown in the diagram. The two glass tubes are so adjusted that they will just reach the surface of the liquid filling the U-tube when the required volume has been collected. The level to which the percolate should reach in the U-tube is determined before the experiment.—Pharm. Journ., July 30, 1904, 140.

Extraction Apparatus—Form Suitable for Large Quantities.—J. Lohmann describes the glass apparatus shown by Fig. 18, which is suitable for the continuous extraction of large quantities of vegetable powders with volatile solvents, such as alcohol, ether, etc., and is now obtainable from dealers in glass apparatus. The body of the apparatus, *A*, is provided with a tubulure above, through which the substance to be extracted is introduced, the narrow neck, *a*, beneath having previously been loosely stoppered with dry cotton. The extension of the neck is provided with a cock, *K*, through which the extracting liquid traverses a constricted tube, *b*, and thence passes into a suitable flask, into which the apparatus is fitted, communication between the flask and a reversed condenser fitted into the tubulure of *A* being established by the lateral tube shown in the drawing. The body of *A* having been charged with the powder, the solvent is introduced through the tubulure until it begins to flow into the flask beneath and has about one-third filled it. The condenser having then been adjusted, the heat of a sand- or water-bath is applied, and the overflow from the cock *K* into the flask is so regulated that it shall be about as fast as the inflow from the condenser, while maintaining a shallow layer of solvent on the surface of the powder

FIG. 18.

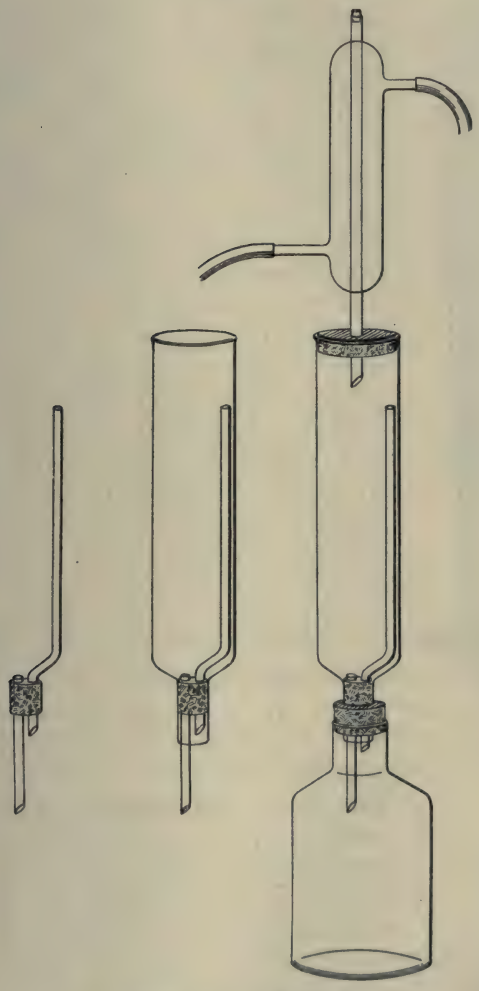


Extraction Apparatus.

throughout the process of extraction.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 959; from Pharm. Weekbl., 1904, No. 43.

Extraction Apparatus—Cheap Construction.—Franklin N. Strickland describes in detail the method of constructing the home-made extraction apparatus shown by Fig. 19, which only requires a little experience in

FIG. 19.

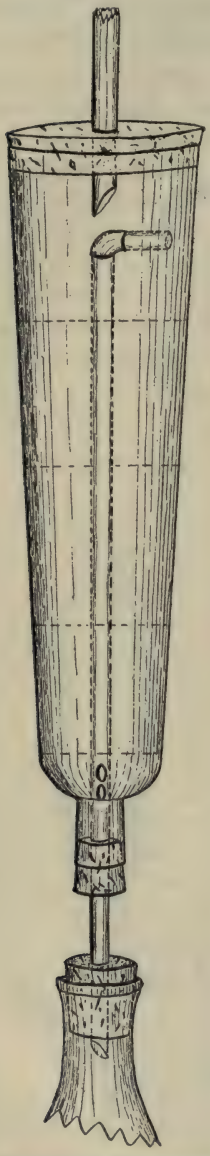


Extraction Apparatus.

working glass. The several parts are shown so plainly in the illustration that little explanation is required. The percolator consists of a glass tube, from 1½ to 3 inches in diameter, depending on the desired size of the apparatus, which is drawn out in the flame at one end so as to form a neck

somewhat larger in diameter than that of an ordinary glass percolator. A sound bi-perforated cork bearing two glass tubes, as shown separately, is inserted into this neck, one of the tubes extending downward into the flask into which the percolator is fitted by means of a good cork; the other tube, slightly bent so as to conform to the shape of the percolator, extends upward, for the transmission of the vaporized solvent from the flask through the material to be extracted into the upright Liebig's condenser, inserted into the mouth of the percolator through a cork—the completed apparatus being shown with the details mentioned in the drawing. The percolator is charged with the material to be extracted (the usual moistening with the solvent having been effected), sufficient menstruum is introduced into the flask, and, after the several parts have been connected, heat is applied to the flask, and the process of extraction allowed to proceed automatically in the well-known manner.—Drugg. Circ., July, 1904, 141.

FIG. 20.

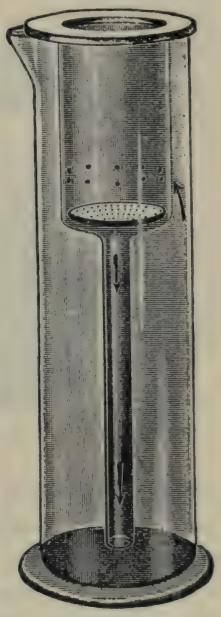


Extraction Apparatus.

Another home-made extraction apparatus has been called to the mind of Burt E. Nelson by Mr. Strickland's description of the preceding. The apparatus is constructed from an ordinary flaring-necked percolator, as shown by Fig. 20, through the lower cork of which extends a metal pipe beveled below, perforated with two holes just above the lower cork of the percolator, and terminated by a readily-removable L above. Within the percolator are to be used several perforated disks. The lower of these is first slipped over the inner tube (the L being first removed), and is covered by a disk of canton flannel, upon which the first portions of powder are loosely packed. The other disks are simply dropped on at intervals during the packing to evenly distribute the menstruum as it descends through the powder. The vapors from the still ascend through the pipe, being prevented from issuing at the lower holes by the resistance of the powder, and after being condensed above the percolator, drop back. The liquid traverses the loosely-packed powder, and eventually returns through the lower holes to the still; hence the pipe must be sufficiently large at its lower part to accommodate both the ascending vapors and the descending liquid.—Drugg. Circ., Nov., 1904, 242.

Autolysator—A Practical Device for Circulatory Displacement.—Dr. Ubber has devised and patented the apparatus shown by Fig. 21, which is intended for conveniently and automatically effecting the solution or extraction of salts, resins and other substances. It consists of a cylindrical glass cup, provided with a broad flange on its upper extremity, by means of which it may be suspended in a cylindrical vessel containing the solvent. This cup is provided with numerous small holes for the admission of the solvent, and at the bottom with a narrow tubular extension, covered with a perforated porcelain disc, upon which the substance to be dissolved or extracted is placed. If desirable a layer of cotton or other filtering medium may be placed beneath the perforated disc so as to secure a perfectly clear solution. The solvent entering through the small holes, becoming saturated, passes through the tubular extension to the bottom, and being automatically replaced by the fresh solvent more rapidly effects solution or extraction than is possible by the ordinary method of conducting circulatory displacement.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 896.

FIG. 21.



Autolysator.

FIG. 22.

Extraction Apparatus.

Continuous Extraction Apparatus—New Form for "Perforation" with Heavy Volatile Solvents.—E. Baum has constructed the apparatus for the continuous extraction of solutions by "perforation" with heavy volatile solvents (particularly chloroform), which is shown by Fig. 22, and requires little explanation. A Soxhlet extraction tube is provided with an outflow tube, bent upwards at right-angles and reaching to about ⅓ its height. The liquid to be "perforated" is placed into this extraction-tube, which is about 3 Cm. in diameter, and inclosed in an adapter, to the upper part of which a condenser is attached, while the lower, out-flow tube, is inserted into the neck of a distilling flask, containing the requisite quantity of volatile solvent (chloroform).—Pharm. Ztg., *49*, No. 101 (Dec. 28, 1904), 1105; from Chem. Ztg., 1904, No. 98.

Double-Walled Infusion Jar—A Useful Substitute for the Ordinary Form.—Dr. Bulnheim has devised the infusion jar shown by the accompanying cuts (Figs. 23 and 24), which possesses material advantages over the ordinary form,

and serves also some of the purposes of sterilization. The construction is such that the heated contents may be poured out without interfering

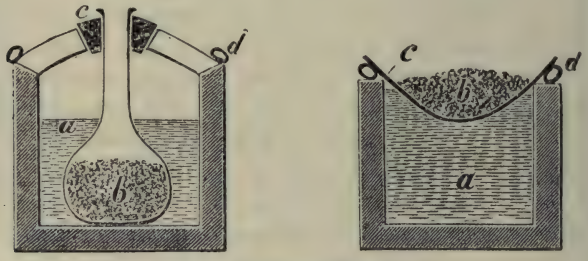
FIGS. 23 AND 24.

Double-Walled Infusion Jar.

with the surrounding heating water, which, moreover, need not be large in quantity, permits rapid heating, facilitates the maintenance of heat, and is economical in fuel.—Pharm. Ztg., *50*, No. 28 (April 5, 1905), 295.

Thermophor-Water-Bath—A Useful Apparatus for Prolonged Heating.—Norrenberg has devised the water-bath shown by (Figs. 25 and 26) in two forms of application, which is supplied under the name of thermophor-water-bath, and designed to maintain a uniform temperature in operations regarding heating. It is constructed of a non-conductive material—the precise nature of which is not mentioned—thick walled, and provided with a cover of similar thickness, as shown by (Fig. 25), *a* being hot water,

FIG. 25. FIG. 26.



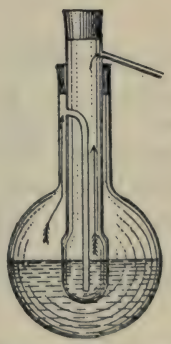
Thermophor-Water-Bath.

b the flask with contents to be heated, *c*, cork wedges securing the protruding neck of the flask and hermetically closing the central opening in the cover, *d* being the cover-handle; while (Fig. 26) shows the same bath when the heating of material is to be effected in an open vessel, *a* being

the water, *b* the materials, *c* a specially constructed nickel evaporating dish, the handles of which, *d*, rests upon the wall of the water-bath. In use, the thermophor is immersed for ten minutes in boiling water, removed, filled with the required quantity of the same hot water, and the flask or evaporating dish then adjusted as shown—the latter so that the water shall be in contact with as much of the surface of the dish as possible. The water, which preliminarily may show a temperature of about 76° C., will probably fall in temperature to 73° C. in the course of 1½ hours, and to 70° C. in 2 hours; but while the temperature is thus shown to recede very slowly, it becomes necessary from time to time to renew the hot water if the heating is to be prolonged for a whole day. In other cases, a sufficiently high temperature may be maintained for a long time without the necessity of resorting to a change of water. Metallic evaporating vessels (of nickel, etc.) transmit the heat better than porcelain ones, and are therefore preferably used.—Pharm. Ztg., *49*, No. 56 (July 13, 1904), 589.

Steam Distillation—Convenient Laboratory Apparatus.—Tozzi-Escot describes the steam-distillation apparatus shown by Fig. 27, which he has found convenient in determinations of volatile acids, particularly in wines and other fermented beverages. It consists of a central distillation tube of glass, 14–18 Mm. in diameter, open above, closed below, and there expanded somewhat so as to have a capacity in the bulb-shaped expansion of about 20–30 Cc. This tube is about 300 Mm. long, and is provided about 18–20 Mm. from the top with a tube extending outward for carrying the vapor to the condenser, and about 180 Mm. from the bottom with a tube, attached on the interior and extending to near the bottom of the bulb—the diameter of the latter being such that it will conveniently pass through the neck of an ordinary distillation flask, being held in position by means of a perforated stopper. The liquid to be subjected to distillation having been introduced into the bulb, the upper orifice of the tube closed, and the cooler attached, heat is applied to the flask containing water (or other desirable liquid). The steam (or vapor) from the latter then finds its way only through the small tube into the interior of the distillation bulb, and thus effects the vaporization and distillation of the contents of the latter.—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904)), 784; from Bull. Soc. Chim., 1904 (3), *31*, 932.

FIG. 27.

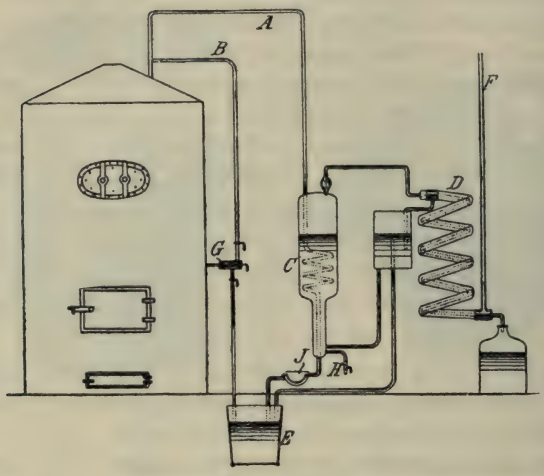


Steam-Distillation Apparatus.

Water Still—A Practical Arrangement.—A. Kopeken has devised the arrangement (shown by fig. 28) for preparing distilled water conviently and economically by the aid of steam under pressure. The live steam conveyed from the boiler by tube *A* through a coil contained in the distilling vessel *C*, containing the water to be distilled, is condensed in the

passage, and collects eventually in the reservoir *E* from which it is pumped back into the boiler through the tube *G*. The water vapor generated in

FIG. 28.

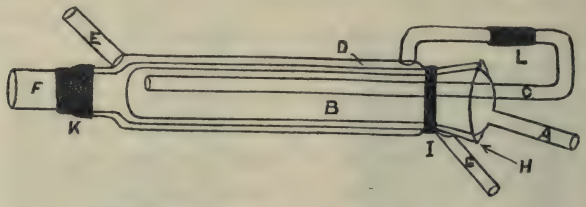


Water Still.

C is condensed in the cooling coil *D* and through this reaches the receiver, while the cooling water from the upper part of *D* supplies the water to be distilled at a temperature of 80° C at *J*, the excess being also carried into the reservoir *E*—provision being made as shown, to keep the water in the still at a constant level.—Phar. Ztg., *50*, No. 46 (June, 10, 1905), 485 ; from Farm. Notisbl. 1905, No. 5.

Double-Surface Condenser—Improved Form.—Herbert Edward Burgess having mentioned his objection to most forms of double-surface con-

FIG. 29.



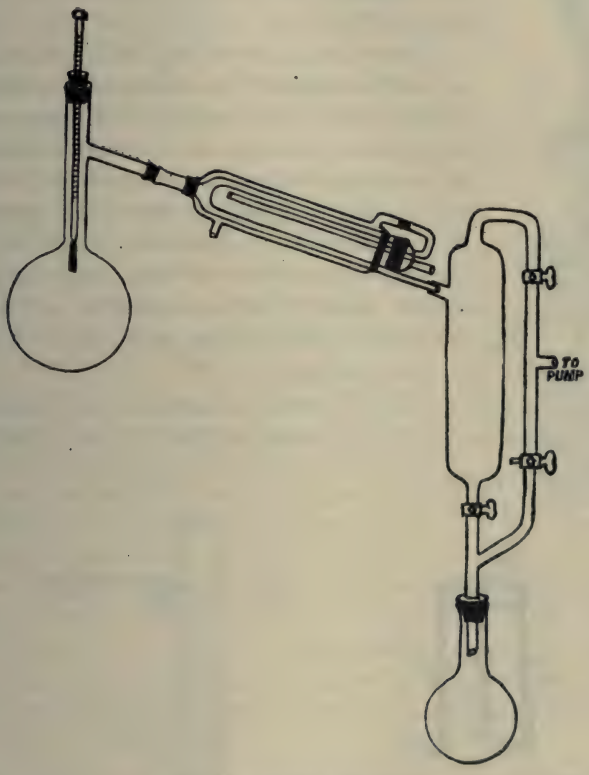
A Cold water inlet to
B Inner cold tube.
C Outlet from ditto through
L Rubber joint to
D Outer cold-water jacket.
E Outlet from ditto.
F Condenser tube.
G Outlet from ditto.
H Ground joint.
I and K Rubber joints.

Double-Surface Condenser.

denser to the manufacturers of such apparatus, such as difficulty in cleaning, liability to breakage from hot vapor when it meets the cold part of the

condenser, the necessity of numerous joints of sealed glass, and the general adaptability only when in a vertical position, made some suggestions which have resulted in the construction of the condenser shown by Fig. 29. He found this improved form on the severest test to be very efficient; it is primarily intended for distillation with direct steam, but answers equally well for ordinary distillations or under reduced pressure. It can be easily cleaned by removing the inner condensing tube; in case of break-

FIG. 30.



Double-Surface Condenser.

age any part may be easily renewed at very small cost, or, in fact, can be replaced from the stores of any ordinary laboratory, or it may be used in any position with or without vacuum. For distillation under reduced pressure, where portions have to be separated, the fractionating end as shown in Fig. 30, will be extremely useful and convenient. The condenser takes less than one-third of bench room than an ordinary Liebig-type condenser.—Chem. News, Nov. 18, 1904, 249.

Bunsen Burners—Safety Attachment.—L. Steinlen has devised an at-

tachment for Bunsen burners shown by Fig. 31, whereby the danger from explosion by contact with the flame is obviated. Its contact, from fine-meshed copper netting, and strips of sheet-copper, is plainly indicated by the drawing and requires no further explanation. It is held in position, and can be raised or lowered, by means of the set-screw. The copper ring and its supports should be sufficiently strong to support the weight of dishes, etc., which may be placed directly on the wire netting.—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 786.

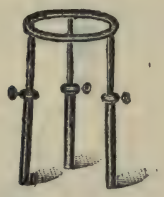
Fig. 31.

Bunsen Burner.

Platinum Crucibles—Cause of Instability.—G. Siebert calls attention to the necessity of perfect homogeneity of the metal from which platinum utensils are made. The instability of platinum crucibles is not so much due to faulty treatment when in use, as to the physical condition of the metal employed for their construction; a want of perfect homogeneity affecting the resistance of this metal just as it does utensils made of steel or bronze that are deficient in this respect.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 896; from Chem. Ztg., 1904, No. 74.

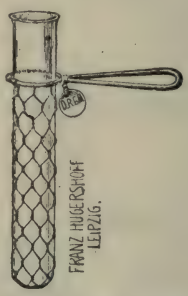
Adjustable Tripod—A Useful Device.—Fortmann has devised the adjustable tripod shown by Fig. 32, which permits the raising and lowering

Fig. 32.



Adjustable Tube.

Fig. 33.



Test-Tube Holder.

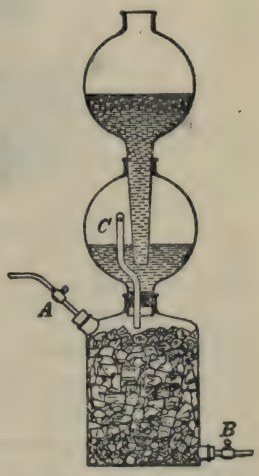
of the support to accommodate different burners, or to increase or lessen the distance from the flame. As shown, the legs of the tripod slip into tubes provided with set screws to hold the legs at the height desired.—Pharm. Ztg., *50*, No. 11 (Feb. 8, 1905), 111.

Test-Tube Holder—A Convenient Device.—Franz Hugershoff has devised and supplies in different sizes the convenient and practical test-tube holder illustrated by Fig. 33, which requires little explanation. It consists of a wire netting attached to a handle which is also provided with a

hook for the reception of a suitably constructed tag, if desired, giving information concerning the contents of the tube.—Pharm. Ztg., *50*, No. 46 (June 10, 1905), 487.

Gas Generator—Improved Form.—McCoy has devised a new form of gas generator, shown by Fig. 34, which is composed of three glass vessels accurately fitted into each other by careful grinding. The lower of these, of about 2 liters capacity, is for the reception of the solid chemicals, and is provided with two cocks, the one above for the outflow of the generated gas, the other below removing the expended acid, both cocks being held in position by the aid of perforated rubber stopper. The central vessel is closed beneath by a perforated rubber stopper bearing the small glass tube *C*, having an internal diameter of about 0.8 Cm., closed on the top, but provided near the top with a small opening, by means of which communication is established between the two parts. The upper vessel is the reservoir for the acid, open at both ends. On opening the cock *A*, the acid descends into the central vessel, reaches the small opening of *C*, and through this passes very slowly, drop by drop, into the generating vessel beneath, the gas generated escaping at *a*. On intercepting the outflow at *A*, the generation of gas continues until the small excess of acid is expended, producing sufficient pressure to prevent the further inflow of acid, and according to the degree of pressure, driving a portion of the acid from the central into the upper vessel. When the expended acid has accumulated to the height of 3 or 4 Cc. in the generator it may be removed by means of the cock *B*. The flow of gas can be regulated by interposing a capillary tube between the cock *A* and the wash-bottle.—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 784.

FIG. 34.

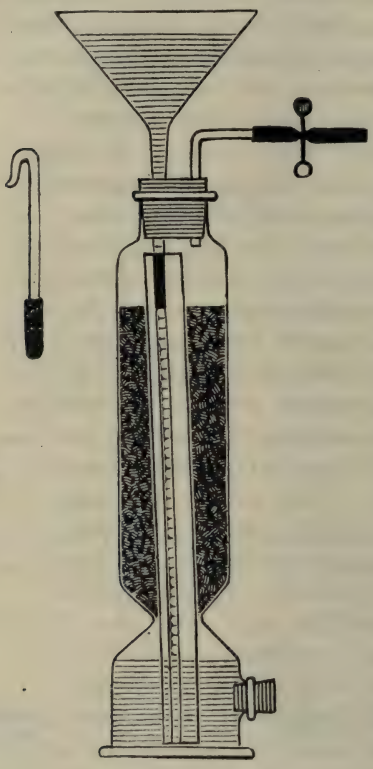


Gas Generator.

Kipp's Apparatus—Cheap Construction.—F. Southerden has found the Kipp's apparatus (shown by fig. 35) very convenient in experiments where a controllable current of gas is required. An ordinary "lime tower" is the main feature. Down the center of this passes a piece of wide-bore tubing, which fits loosely the constriction in the tower. This very effectually prevents solid matter—zinc, marble, or iron sulphide—from entering the lower bulb, then being filled in after the tube is in position, whilst its open end is temporarily plugged. The neck of the funnel is drawn out slightly, and a piece of glass tube attached so as to reach the bottom of the tower To replenish the acid when exhausted it is blown up into the funnel, and emptied out. The piece of glass rod shown with the rubber

cap serves as a stopper to the funnel when required, and to the outer tube when charging the apparatus with material from which gas is to be produced.—Chem. News, Dec. 9, 1901, 287.

FIG. 35.

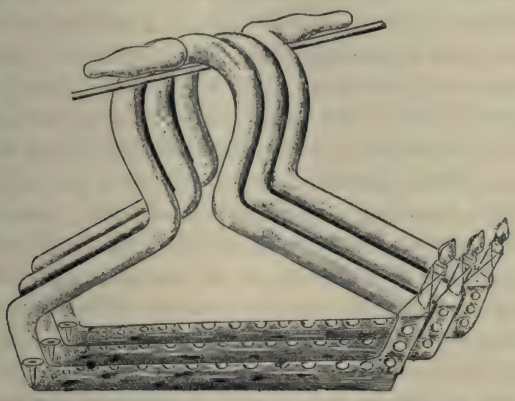


Kipp's Apparatus.

Gas-Washing and Absorption Apparatus—Efficient Construction.—Zwieback has devised the new form of apparatus for the absorption and washing of gases shown by Fig. 36, which presents marked advantages over the conventional forms. It consists of a serpentine tube of peculiar constriction and forming a series of separate absorbers or washers for the reception of different fluids—if desirable—in the elongated horizontal part of each winding. These are provided at the inflow-extremity with a fine constriction, so that the gas may be admitted slowly, and at the other extremity with neck-like extension, closed with a ground stopper, for the introduction of the washing or absorbent medium. Under proper regulation, the gas is caused to traverse the fluids in these several compartments in form of numerous small bubbles—15 to 20 in each—thus securing prolonged contact even if the gas passes with comparative rapidity,

the latter being regulated by the more or less inclined position of the elongated straight portions of the tube.—Pharm. Ztg., *49*, No. 56 (July 13, 1904), 588; from Chem. Ztg., 1904, No. 50.

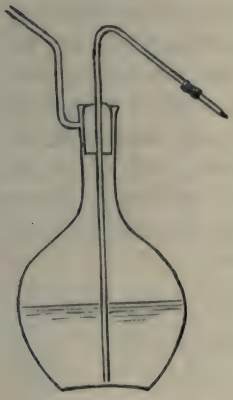
FIG. 36.



Gas-Washing and Absorption Apparatus.

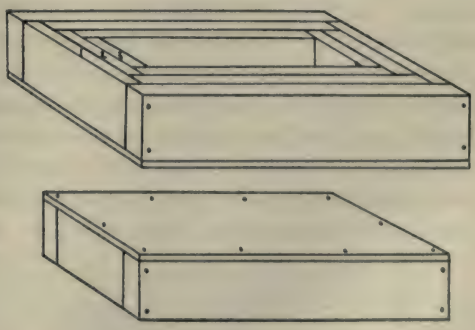
Wash-Bottle—Device to Maintain Pressure.—A new form of wash-bottle, constructed so as to enable a jet of liquid to be maintained for a considerable time without strain to the operator or danger of the vapors reaching the mouth, has been devised by Hugo Dubovitz. As shown by Fig. 37, the whole is of glass, and the stopper carrying the delivery-tube has a hole that can be brought opposite the blow-tube, and then, when sufficient pressure has been obtained, turned on one side. The tendency of the stopper to blow out can be restrained by making it narrow and long, like the glass stop-cocks in general use. This wash-bottle is convenient for use with boiling water, H_2S water, ether, etc.—Chem. News, Mar. 31, 1905, 147.

FIG. 37.



Wash-Bottle.

FIG. 38.



Nested Powder-Folder.

Nested Powder-Folder—A Convenient Form.—Jos. F. Hostelly suggests the nested or telescopic form of powder-folder shown by Fig. 38, which consists of diminished sections which slip into each other in the form of a nest. The upper figure in the sketch shows the forms nested; the lower figure shows a single form upright, ready for use. As indicated by the drawing, the bottom of the forms are open, making possible the telescoping, while the tops are of thin sheet-brass screwed to the sides, which are constructed of thin strips of some hard wood, such as oak, mahogany or cherry, say, $\frac{3}{16}$ inch thick. The brass piece forming the tops should be screwed to the sides with short, slender, brass screws, having flat heads that should be counter-sunk, affording an even surface to the top of each form. The forms may be fashioned of such dimensions that powders of certain sizes are folded over them only in one direction, that is, over the length of the form, one size only to each form, or in two directions, over the width as well as over the length, two sizes to a form. Thus each form gauges and facilitates the folding of powders of two different sizes. Observing this system, it may be necessary to vary the thickness of the strips used in making the sides of the forms, making one form of thicker or thinner sides than its large companion to realize the nesting of the next smaller section. Of course, there is no objection to one form being much smaller than the next larger in size, and leaving a space around the sides when nested.—Merck's Rep., January, 1905, 5.

Neutral Glass Bottles—Method of Determining Suitability for Sterilized Solutions.—Baroni observes that, although certain makers of neutral glass bottles for sterilized solutions mark their bottles with a red band, this is not necessarily a guarantee of suitability for this purpose, since imitations are put upon the market which do not prove absolutely neutral, but yield sufficient alkali to decompose such solutions as morphine hydrochloride, strychnine nitrate or mercuric chloride, especially when these are heated to 120° C. in the sterilizer. It is therefore necessary to test glass bottles before using them for alkaloidal and certain hypodermic injections. This may be done by filling them with 0.5 per cent. solution of strychnine nitrate, 1 or 2 per cent. solution of morphine hydrochloride, or 0.5 per cent. of mercuric chloride, and heating them under pressure in the sterilizer to 112° C. If the glass be neutral the solutions remain unaltered, but if it be alkaline, the morphine solution turns brown, and, when cold, deposits crystals of free alkaloid on the sides of the bottle; the strychnine solution shows crystals of that base, while the mercuric solution will have a precipitate of yellow or red mercuric oxide.—Apoth. Ztg., *20* (Feb. 11, 1905), 101; from Bollet. Chim. Farm., *24*, 857.

Cork—Method of Sterilization.—It is well-known that cork bark is liable to be infected with fungi, such as *Aspergillus niger*, *Penicillium glaucum*, etc., upon the surface, but more particularly by the more or less deep penetra-

tion into the cellular structure of the cork of mycelium strands, which in turn, in contact with the fluids, give rise to the development of moulds in them. Bordas finds the chemical agents usually employed for cleaning and purifying cork bark, such as hypochlorites, chlorine, or sulphurous acid are without effect upon the moulds pervading the medullary canals of the cork substance and particularly ineffective upon the intercellular mycelia. Their complete destruction results, however, if sterilization in a vacuum is resorted to. For this purpose the corks are heated in a vacuum apparatus for 10 minutes at 120° C.; a vacuum is then established, whereupon steam at 130° C. is passed through the apparatus for 10 minutes more.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 674; from Chem. Centralbl., 1904, ii, No. 3.

Corks—Method of Rendering Them Impervious and Acid-Proof.—It is recommended in Jour. d. Pharm. v. Elsass-Lothr (1904, No. 9) to render corks impervious and resistant to the action of the acids, by immersing them for several hours in a warm solution of 15 Gm. of gelatin and 24 Gm. of glycerin in 500 Cc. of water (at 44°–48° C.); then drying them in the dark and finally dipping them in a warm (40° C.) mixture of 2 p. of vaseline and 7 p. of paraffin. The latter operation may be omitted, however, if a little ammonium dichromate is added to the gelatin solution, and the corks are then exposed to light.—Pharm. Ztg., *50*, No. 11 (Feb. 8, 1905), 110.

Paraffined Corks—Preparation on a Large Scale.—Referring to the recently-described process of rendering cork-stoppers more elastic and impervious by filling the pores with casein (see "Korkit," Proceedings 1904, 514), W. A. Dawson calls attention to the utility of corks saturated in a similar manner with paraffin. A well paraffined cork is as much superior to untreated cork as a "mercerized" textile is superior to a cloth that is woven in the ordinary way from cotton yarn that has not undergone the improving process of mercerizing. A well paraffined cork-stopper differs but slightly in appearance and feel from a stopper cut from the finest quality of clear velvet corkwood. It is a little more "silky" in look and feel, there is no trace of greasiness when rolled between the fingers, nor can any unpleasant odor be detected where good wax is used. They are far more durable than ordinary corks, and are stained or hardened by few substances. They slip easily into the neck of a bottle, and are easily removed without danger of breaking off. They do not become cemented fast to the glass with saccharine, resinous or extractive matter. There is no danger of their imparting taste or odor to the contents of a bottle on long standing. As to the best method to be adopted for preparing paraffined corks on a commercial scale, this must necessarily develop by experiment. As the author conceives it, the thing seems very simple and quite inexpensive. The operation is similar to creosoting or fireproofing timber, the corks being placed in an air-tight tank from which the air is exhausted. This is done twice. The first time the pores are cleansed of

dust, which is forced out with the air confined in these cavities by the action of the exhaust. The second time, the corks, without being removed from the vacuum chamber, are lowered into the hot solution of paraffin, where they are held deeply immersed while the air pressure is allowed to gradually rise to the normal point; or, it may be necessary to apply a pressure of two or three atmospheres, which forces the hot wax into every pore and opening in the corkwood. After this the corks, contained in a basket-like arrangement of wire, are lifted out of the paraffin bath and allowed to drain, at normal pressure, of course, in a temperature just above the melting-point of the wax, and until the excess of wax is removed or dripping ceases. Possibly a finishing process, like rolling in a polishing drum or some similar operation, may be found necessary to free the corks from the last vestige of wax on the surface.—Drugg. Circ., October, 1904, 220; from Proc. N. Y. State Pharm. Assoc., 1904.

Corks—Preparation for Volatile Liquids.—Gawalowski recommends the following treatment of corks to render them suitable for stopping volatile liquids and making them permanently soft and elastic: After soaking the corks in hot water they are dried moderately and immersed from two to four weeks in sulphuric acid of 50°–60° (= 64 to 80 per cent. H_2SO_4). The corks are then thoroughly washed with cold water, macerated in alcohol of 30°–50° for three to five days, and dried. Corks prepared in this way yield nothing to ether, benzin or alcoholic liquids.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 898.

Lidium—Artificial Cork.—At the recent exposition of dwellings and building materials in Paris a small building was exhibited which was built of a material called *lidium*, or "artificial cork," obtained by submitting cork-dust to enormous pressure. Lidium can be pressed into any shape, and hence will serve as material for no end of articles of household use. It looks like cork, only it is not so porous as that substance, and feels smoother to the touch. Like the unpressed material, lidium does not burn. It simply carbonizes, and that superficially, so the new material is practically fireproof.—Nat. Drugg., Sept., 1904, 262.

Labels—Systematic Storage.—W. A. Dawson contributes a practical paper on the systematic storage of labels, which can be profitably consulted only in connection with the detailed explanation of the numerous drawings accompanying his paper. These embrace suggestions as to the arrangement of the label-drawers in daily use, as well as for that of a cabinet intended for the surplus stock of labels, the drawers for the latter being simply porous-plaster boxes, which moderately accumulate in every pharmacy, and serve excellently for this purpose.—Amer. Drugg., Febr. 13, 1905, 65–67.

Label Moistener—A Simple Device.—Neitzel constructs an efficient label moistener by covering a cubical (5 Cm.) block of hard wood with chamois-

skin, and placing this in a saucer containing water. The leather, by capillarity, becomes and remains moist, and communicates it to the label, when it is pressed upon the surface of the covered block.—Pharm. Ztg., *50*, No. 3 (Jan. 11, 1905), 29.

B. Preparations.

AQUÆ.

Aqua Amygdalarum Amararum, Ph. Ger.—*Practical Observations.*—An anonymous contributor to "Südd. Apoth. Ztg." (1905, No. 8) makes the following practical observation concerning the preparation of the official (Ph. G.) bitter almond water: 3 kilos of sound bitter almond are deprived of fixed oil by expression, yielding from 1030 to 1100 Gm. of oil, which after filtration is suitable for all purposes for which it is required. The press-cake is then pulverized as fine as possible, mixed with distilled water, allowed to stand 6 hours, and subjected to distillation with steam under reduced pressure. After the official quantity of distillate (2250 Gm. to which 750 of alcohol is added) is obtained, the distillation is continued and two additional portions of about 2000 Gm. and 500 Gm. respectively are obtained, and mixed with alcohol in the same proportion. The several products are then assayed, and adjusted to the official hydrocyanic acid content by admixture of the several portions in the quantities determined by the assay. The yield usually amounts to 6100 Gm., and the product is cheaper and more satisfactory than that usually obtained by purchase. The distillation, as described, consumes from 1½ to 2 hours. The author lays stress on the importance of not continuing the maceration of the almond powder in the water beyond 6 hours, the yield of HCN being, for example, considerably less when the maceration is prolonged to 12 hours. Purchased almond press-cake, also gives inferior yields.—Pharm. Ztg. *50*, No. 17 (March 1, 1905), 177.

Cherry-Laurel Water—Cocaine Hydrochloride a Reagent to Distinguish Fresh from Old Distillates.—Barillé observed that the use of cherry-laurel water as a preservative for hypodermic injections, especially of alkaloidal salts, must be condemned, since it is found that, unless quite recently prepared, it occasions a precipitate. The body which occasions this has not been isolated. It is not the hydrocyanic acid, and is not present in the cherry-laurel water when it is first distilled. Another objection to the use of this water is that it increases the pain of hypodermic injections. Since it is prescribed solely to prevent the development of fungoid growth in the solutions, its use should be abandoned in favor of sterilization in the autoclave. Cocaine hydrochloride is very markedly precipitated by old cherry-laurel water, but is not affected by that freshly distilled. It may serve, therefore, as a delicate reagent to distinguish fresh from old distillations. —Pharm. Journ, May 13, 1905, 693; from Journ. Pharm. Chim. (6) *21* (1905), 337.

CHARTÆ.

Charta Sinapis, B. P.—Improved Process.—Drawing attention to some of the defects of the B. P. process for making mustard paper, A. W. Gerrard suggests the following process as being reliable and satisfactory: Take equal parts of black and white mustard deprived of its fixed oil, in No. 60 powder, 1 part; solution of india-rubber in benzol (1 in 40), 4 fluid parts. Mix well until uniform. Spread the mixture evenly over suitable paper in a thin layer, either by means of a plaster-spreading machine or by passing the paper over the mixture contained in a shallow vessel. Expose in a warm place for a short time to dry. Preserve the paper in well-closed tins or boxes. Mustard paper must not be long exposed to light or air in the drying process, as it is found by so doing the mustard bleaches and the india-rubber perishes. Beyond this, mustard paper is hygroscopic, so that if hung too long in a moist atmosphere it is easily ruined. It must be dried quickly.—Pharm. Journ., Dec. 3, 1904, 805.

Parchment Paper—Modern Sorts a Source of Mould.—In the course of a recent legal controversy concerning the formation of mould, on butter of unquestioned good quality, which had been supplied in wrappings of parchment paper, the testimony of an expert, Dr. Krüger, pronounced the source of the mould to be starch syrup, which is modernly used for "finishing" the parchment paper, whereas formerly glycerin was used for this purpose, but since abandoned on account of its high price. The layer of starch forms an efficient culture medium for the development of the fungus, while glycerin does not supply the necessary nutrition. Unfortunately, the literature does not give reliable information concerning the manufacture of parchment paper, which, as is well known, is modernly used extensively for a variety of purposes.—Pharm. Ztg., *49*, No. 66 (Aug. 17, 1904), 694.

CAPSULÆ.

Sandal Oil Capsules—Simple Test of Quality.—P. Runge calls attention to the necessity of applying suitable tests for identifying the quality of the sandal-wood oil in the commercial capsules, which often contain the West Indian, instead of the required East Indian oil, either wholly or in part. Beside the determinations of specific gravity, rotatory power, solubility, the santalol number and the odor, the simple reaction proposed by Conrady will prove most serviceable. This consists in adding to 7.5 Cc. of a mixture of 9 p. of glacial acetic acid and 1 p. of hydrochloric acid, 2 drops of the suspected oil. Pure East Indian sandal-wood oil produces a colorless solution, which retains this condition for at least 10 minutes, whereas the usual adulterants yield within this time a rose- to dark-red coloration. —Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 671.

COLLODIUM.

Collodium Elasticum, G. P.—Manipulation.—The G. P. iv directs tur-

pentine instead of Canada turpentine for preparing flexible collodion. Lorenzen calls attention to the possible introduction of impurities from this source, and therefore recommends the solution of the turpentine (5 p.) in spirit of ether (10 p.), filtration of the solution, and addition to castor oil (1 p.) and collodion (94 p.).

Thymol Collodion may be prepared by dissolving 1 p. thymol in 4 p spirit of ether and adding this to 95 p. of collodion.

Camphor Collodion, by dissolving 5 per cent. of camphor in collodion. —Pharm. Ztg., *50*, No. 2 (Jan. 7, 1905), 20.

CARBASUS.

Formaldehyde Gauze and Bandaging—Method of Preparation and Sterilization.—P. Zelis recommends the following practical method for preparing formaldehyde bandagings in which the antiseptic is uniformly and efficiently distributed:

Formaldehyde Cotton, 1 per cent.—Formaldehyde solution (Ph. Ger. IV), 35.0 is mixed with glycerin, 60.0 and alcohol (or methyl alcohol), 1600.0. This is sufficient to impregnate 1000.0 of absorbent cotton. The latter is spread out in sheets, the edges of which are folded over so as to prevent loss of the solution by overflowing, and the solution is uniformly distributed on the surface so that it shall be completely absorbed. The sheets are then dried on wooden trays, protected from sunlight and without artificial heat, until they no longer feel moist when touched, but not to absolute dryness. The antiseptic may, if desirable, be fixed by spraying the sheets with a solution of 60.0 of lanolin in 300.0 of ether—using this entire quantity for the sheets of cotton previously impregnated with the formaldehyde, laying them out smoothly upon each other, folding, pressing them during two hours, and then spreading them out as originally to dry.

Formaldehyde Gauze, 2 per cent., is obtained by immersing 1200.0 absorbent gauze in a solution of 75.0 formaldehyde solution (Pharm. Ger. IV), 125.0 glycerin and 1300.0 alcohol (or methyl alcohol) and drying the saturated gauze in the dark, suspended on lines, but not to absolute dryness. The antiseptic may be fixed by immersing the impregnated gauze in a solution of 100.0 lanolin in 700.0 ether and 700.0 alcohol (or, in place of these solvents, 1400.0 benzin), expressing the excess of the woolfat solution by the aid of a clothes-wringer, and evaporating the solvent in an airy locality, protected from light. The

Sterilization of Bandaging Material with Formaldehyde is readily effected, without special apparatus, as follows: The material is carefully disposed and enveloped in good, white blotting-paper, the package tied with white twine, and folded in a stronger quality of packing-paper, leaving the ends open for the admission and circulation of gaseous formaldehyde. The package is then exposed for twenty-four hours to the vapor of

formaldehyde, by enclosing it in an ordinary packing-box containing a layer of wood-wool saturated with formalin and water, over which a wicker-tray, for the reception of the packages of material to be sterilized, is suspended. The formalin may be replaced by paraformaldehyde, observing that in either case fresh portions of the antiseptic are added from time to time, as the odor of the liberated gas becomes weaker. The material so sterilized, and now securely enfolded and tied, may then be preserved by transferring the package to a similarly prepared sterilization chest. This method, both of preparation and sterilization, has proven reliable and quite satisfactory.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 617–618.

Isoform Gauze—Preparation.—E. Weyrich recommends the following process for preparing isoform gauze, using for this purpose the commercial "Isoform Paste" (which see under "Isoform"), containing fifty per cent. glycerin. To make a 3 per cent. gauze, for instance, 10 Gm. isoform-paste (=5 Gm. isoform) are triturated with a little water and transferred to a capacious dish (about 2 liters), adding 6 Cc. of glycerin and enough water to make the measure up to 320 Cc. A piece of gauze, 5 meters in length and weighing about 150 to 160 Gm., is now saturated with pure water, wrung out as completely as possible, and immersed in the isoform mixture, which is just previously thoroughly stirred. When the fluid is all absorbed it is removed and expressed forcibly, collecting the expressed liquid in the same dish. It is then again folded, again immersed in the isoform liquid, and when all this has been absorbed, expressed as before—this operation being repeated a number of times in order to secure a uniformly impregnated gauze, but generally not requiring over 5 minutes in all. Finally, the gauze, after having absorbed all the liquid, is suspended in a flat horizontal position, so that it may rapidly dry at the temperature of the air. When dry, it is folded and wrapped.—Pharm. Ztg., *50*, No. 3 (Jan. 11, 1905), 29.

C. New Remedies

and trade-named specialties.

Acidol is the trade-name given to betaine hydrochloride, a crystalline salt readily soluble in water and containing nearly the same percentage (23.8 p. c.) of HCl as the official (G. P.) hydrochloric acid. Owing to the ease with which this salt splits up hydrolytically in aqueous solution, and thus liberates the hydrochloric acid, it is exploited under the above name as *a substitute for hydrochloric acid*, possessing the advantage over the free liquid acid, by being in solid form, more conveniently preserved, and permitting more accurate dosage. It is recommended to dispense it diluted with plant powders, pepsin, etc., and is supplied also in tablet form, each tablet containing 0.5 Gm. of acidol, of which 1 or 2 are given at a dose, dissolved in ½ wine-glass of water.—Pharm. Ztg. *50*, No. 33 (April 25, 1905), 351.

Adrenalin- and Suprarenin-Bandagings are supplied in various forms for convenient and expeditious use in cases of hæmorrhage. The gauzes contain 0.5 per cent. of suprarenin, or adrenalin, tampons contain 0.5 per cent. on the outside, but only 0.01 per cent. on the interior mass (cotton); while the cottons also contain only the latter percentage. It is claimed that, notwithstanding the partial decomposition of the medicament, communicating a rose-gray color to the material, this decomposition is only superficial, and they retain sufficient of undecomposed adrenalin (or suprarenin) to warrant their activity for several months.—Berl. Klin. Wschr., 1905, No. 6.

Adrin is the trade-name given to epinephrin hydrate, to distinguish this particular product from the competing preparations of the suprarenal gland, exploited under the names of adrenalin, suprarenin, etc.

Æther Salicylatus (Ethyl Salicylate?) is exploited by a Berlin manufacturer as a substitute for mesotan (see Proceedings, 1903, 700). It forms a clear solution with olive and castor oil, and is recommended in such as liniment for rheumatism, etc.—Pharm. Ztg., *50*, No. 10 (Feb. 4, 1905), 101.

Aganin is the trade name for a syrup of potassium sulphoguaiacolate exploited in Germany.

Alcohol-Silver Salve is a preparatiou containing 2.5 per cent. of colloidal silver (collargol), 70 per cent. of alcohol (96 per cent.), soda soap, wax, and some glycerin. It is recommended for the treatment of infectious inflammatory conditions, frost-bites, ulcers, eczema, and similar skin diseases.—Allgem. Med. Ztg., 1905, No. 9.

Almetein is the name given in Germany to an odorless powder, soluble in alcohol and in water, which is exploited as a substitute for iodoform. According to "Pharm. Centralhalle" it is a condensation product of hæmatoxylin and formaldehyde.

Almaténia is the name given in France to the same powder.

Alphozone is the name given to a specialty of American manufacture exploited as a superior germicide and antiseptic. It is claimed to be a single definite chemical compound, of constant composition, without admixture of any other substance, and is supplied in the form of a white, fluffy powder, freely and perfectly soluble in water.

Ammonium Sulpholeatum is the name given by H. Peschken to a product intended to replace ammonium sulphoichthyolate.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1904), 1044.

Anasarcin is an American specialty, exploited as a remedy in heart, kidney and liver affections, and said to contain the active principle of *Oxydendron arboreum*, *Sambucus canadensis* and *Urginea scilla*.

Anoemose Milk is a buttermilk preparation, containing 0.15 per cent. of

ferrous iodide, but free from preservatives and aromatic additions of any kind. Recommended as a nutrient in chlorosis and anaemia.—Pharm. Ztg., *50*, No. 5 (Jan. 18, 1905), 51.

Antichlor-Pills are a specialty recommended for the treatment of chlorosis, two pills being given daily. They are composed, according to Kahm, of 0.05 Gm. each of ferrous sulphate, sodium carbonate, quinine sulphate and extract of nux vomica, together with 0.002 Gm. of arsenous acid, in each pill.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675.

Antichoren is the name given to peptonated mercuric chloriodide ($HgI_2 + HgCl_2$), and is obtained by the action of mercuric iodide and peptone on mercuric chloride. It is described as a dark-brown, extract-like mass, soluble in water, and is recommended in syphilis in form of pills in doses of 0.01 Gm., or subcutaneously in form of 2-per-cent. solution.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1106.

Antidecubin is the name given to a protective material for the relief and prevention of bed sores, which is composed of thick felt, provided with an opening of suitable dimensions, held in position by adhesive material on one of its surfaces.—Pharm. Ztg., *50*, No. 35 (May 3, 1905), 370.

Antidol is the name given by Paul Stern to a mixture of citric acid, caffeine, salicylic acid and dimethylphenyl pyrazolon, which is recommended in doses of 1 Gm. as an antineuralgic and antipyretic in headache, colds, rheumatism and insomnia.—Pharm. Ztg., *49*, No. 87 (Oct. 29, 1904), 926.

Antidyssentericum, Koehler, is a specialty recommended in dysentery, diarrhœa, etc., and said to contain the fluidextracts of simaruba, of pomegranate bark, and of logwood.—Pharm. Ztg., *49* No. 91 (Nov. 12, 1904), 969.

Antimarin is the name given to tablets containing 0.2 Gm. of anaesthesin (= para-amido benzoic acid ethyl ester), which are recommended as a remedy for seasickness.—Therap. Monatsh., 1904, No. 12.

Antirinderpest Serum, a serum, in dry form, claimed to be an antidote to the "rinderpest" (cattle plague), is supplied in form of a hard, stable solid, readily soluble in water, and forming a solution which may be heated to boiling without destroying the properties of the serum. It is obtained from the liquid serum—which contains 5 per cent. of sodium hydrate—by spontaneous drying on glass plates.—Centralbl. f. Bakteriol. (v), *36*, No. 1.

Antiscrofulin, exploited as a preventive and remedy in scrofula and tuberculosis, is stated to contain potassium sulphoguaiacolate, potassium iodide and hæmoglobin.—Pharm. Ztg., *50*, No. 10 (Feb. 4, 1905), 101.

Antitænin, a specialty for tapeworm, is described as containing 9.0 Gm. extract of malefern, 1.0 Gm. of cousso, and 0.05 Gm. of podophyllin.—Pharm. Ztg., *50*, No. 7 (Jan. 25, 1905), 71.

Apnol is the name given to an asthma remedy which is said to be a solu-

tion of periplocin, the glucosidal constituent of the bark of *Periploca græca*, together with small quantities of potassium iodide, pyridine, menthol, etc., in water and glycerin. The specialty is recommended particularly in asthmatic conditions, complicated, with cardiac affections, and is administered in the form of vaporizations through the nostrils, a so-called union pulverator being supplied with the remedy.—Pharm. Ztg., *49*, No. 65 (Aug. 18, 1904), 688.

Aqua Ferro-Calcea "Terlik" is the name of an Austrian specialty, composed of ferric pyrophosphate, calcium phosphate, glycerin and an aromatic tincture, which is recommended in anæmia, chlorosis, apicitis, pertussis, rhachitis, and debilitated conditions in general.—Pharm. Ztg., *50*, No. 24 (March 25, 1905), 249.

Arabella Water is a Hungarian bitter water containing, in the liter, magnesium sulphate, 22 Gm.; sodium sulphate, 15.4 Gm.; calcium sulphate, 1.5 Gm.; magnesium chloride, 0.8 Gm.; magnesium carbonate, 1.26 Gm.—Pharm. Ztg., *49*, No. 85 (Oct. 22, 1904), 906.

Aristolöl is a sterilized 10-per-cent. solution of aristol in benne oil, which has unlimited stability, and is recommended for convenient use in diseases of the eye.—Pharm. Ztg., *50*, No. 18 (Mar. 4, 1905), 190.

Arsylin is the name given to a compound of arsenic, phosphorus and albumen (so to speak, "arsen-protylin"), containing 0.1 per cent. of arsenic and 2.6 per cent. of phosphorus. It is a yellowish-white, odorless powder, having a faintly acid taste, insoluble in water, and non-absorbable until it reaches the intestinal tract, and is recommended as a roborant in doses of 1 Gm. (= 0.001 Gm. arsenic) 3 or 4 times daily.—Pharm. Centralh., *45*, No. 35 (Sept. 1, 1904), 665.

Asphalin Tea is the name given to an Austrian specialty recommended for diabetics, which is also designated by the semi-official title "Species Myrtilli Comp.," and is essentially composed of the leaves and blossoms of the huckleberry.—Pharm. Ztg., *49*, No. 85 (Oct. 22, 1904), 906.

Asthmol (*Astmol*) is the name given to a German specialty designed for use as a fumigating powder, and in form of cigarettes for the relief of asthma.

Attritin is the name given to a solution of sodium salicylate, 17.5 Gm. and caffeine, 2.5 Gm., in sufficient water to make 100 Gm., which is sterilized, and supplied in sealed vials containing 2.25 Cc. It is employed for the treatment of ailments, in which salicylic acid is indicated by intravenous or intramuscular injection, and is particularly recommended in lumbago, ischias, and the various forms of articular rheumatism; the dose for adults being 2 Gm. at intervals of from 12 hours to 3 days.—Pharm. Ztg., *50*, No. 2 (Jan. 7, 1905), 20.

Auro-Mercur is the name under which a colloidal preparation of gold and mercury was introduced to the attention of the Fifth International Congress of Dermatology, Berlin, as a remedy in syphilis.

Azadirach is the name given to a preparation of the "China tree" (*Melia azedaraeh*, L.), which is recommended as a remedy in catarrhs and an anthelmintic.

Babain is the name given to a new antipyrine—salicylic acid derivative.

Barutin is the name given to a diuretic specialty, which is designated as being the "double salt of barium, theobromine and sodium salicylate," and is claimed to contain in each gramme the equivalent of 0.169 Gm. $BaCl_2.2H_2O$, combined with 0.255 Gm. theobromine.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327 and *Ibid.*, No. 43 (May 31, 1905), 454.

Benzinoform is the protected trade-name given by its exploiters to a detergent fluid which consists purely and simply of tetrachloride of carbon, CCl_4. It is used in the same way as is benzin, over which it possesses the great advantage in its non-inflammability.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1904), 1041.

Betalysol is the name given to a saponated cresol preparation.

Bioferrin is the name given to a hæmoglobin preparation, which is given in doses of 5–15 Gm. daily to children and 15–30 Gm. daily to adults. No information is at present available concerning the method of its preparation and its characters.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 577; from Münch. Med. Wschr., 1904, No. 27.

Bioplastin is the name given by Simriani to a nutrient and tonic specialty, which is represented to contain lecithin, iron and the phosphates of the egg-yolk as essential components.—D. Med. Wschr., 1904, No. 40.

Bi-Pelatinoids are double-chambered capsules, composed of gelatin and jujube, containing in each chamber (or compartment) different medicinal substances, which it is desirable to keep separated until the capsule has reached the stomach; such, for instance, as ferrous sulphate and sodium carbonate, in the proportions to form Blaud's pills, etc. The capsules are compact, readily soluble, and hermetically sealed.—Pharm. Ztg., *50*, No. 2 (Jan. 7, 1905), 20.

Blutan is the name given to an acid-albumin-fero-manganic-peptonate solution, containing carbonic acid, but devoid of alcohol. It contains 0.6 per cent. of iron and 0.1 per cent. of manganese, and is also supplied with a content of 0.1 per cent. of bromine (*Brom-Blutan*) or 1 per cent. of iodine (*Iod-Blutan*), these preparations having a better taste than that of preparations containing ferrous iodide.—Pharm. Ztg., *50*, No. 35 (May 3, 1905), 370.

Borol is the name given to an American specialty, designed for use as a spray, when diluted with six times its weight of water, in hay fever, nasal catarrh, and in mouth and throat affections. It is said to contain borax, sodium bicarbonate, sodium hydrate, eucalyptol, thymol, menthol, pineol and glycerin.

Brandsanal (Sanal for Burns) is said by its manufacturers to be composed of acid. carbolic, 0.01 ; acid. picrinic, 0.07 ; aqua destill., 10.0, and glycerin, 0.23. It is used, as its name indicates, for the relief of burns.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Brominol is the name of an English specialty, composed of bromine and oil of benne, which is recommeded for the treatment of epilepsy.

Bromlecithins, like iodlecithins (which see), are obtainable with different percentages of bromine content (up to 50 per cent. Br.) under a German patent. Thus, for instance, 10 p. lecithin are dissolved in 50 p. chloroform, and bromine is added to saturation. The product, after standing a short time, is evaporated in a vacuum, and forms a nearly colorless, wax-like mass, containing about 30 per cent. Br.—Pharm. Ztg., *49*, No. 94 (Nov. 23, 1904), 1001.

Candol is the name given to a dry malt extract, which is claimed to contain a high content of diastase.—Pharm. Ztg., *49*, No. 57 (July 16, 1904), 598.

Calcidin is the name given to an American specialty, containing calcium iodide as its active constituent.

Capsula Duplex Stomachica Bowri is a specialty in capsule form, the outer capsule enclosing a smaller one containing a portion of the medicinal ingredients which would otherwise react with the remaining ingredients enclosed by the larger capsule. The capsules exploited under the above title, for instance, contain 0.01 Gm. of silver nitrate in the smaller capsule, which is embedded in a mixture of bismuth subnitrate, 0.25 Gm. ; magnesium sulphate, 0.1 Gm., and sodium sulphate, 0.1 Gm., enclosed by the outer larger one. They are recommended for a variety of stomach affections.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Capsules Dartois are capsules, each containing 0.5 Gm. of cod-liver oil and 0.05 Gm. of boxwood tar.

Cardiolo is the name of an Italian specialty containing squill, lobelia, strophanthus, nux vomica, and guaiacol, in the form of an alcoholic extract.

Casein-Albumose Soap is the name given to a neutral superfatted soap prepared with the addition of lactalbumose, the presence of which causes the soap to retain its neutrality even on hydrolysis, since the albumose combines with any alkali that may be freed from the soap during its solution. This casein-albumose soap serves as a base for a variety of medicinal soaps, but is also used by itself for the treatment of skin diseases. —Seifenfabr., 1804, No. 45.

Cephalopin is the name given to an oily extract of the fresh nerve substance, and is said to contain myelin, lecithin, and other oil-soluble constituents. The preparation is claimed to act as an antidote to strychnine when injected subcutaneously, and to be medicinally valuable for the

treatment of neurasthenia, hysteria, neuralgia, etc.—Rip. de Pharm., 1904, No. 11.

Cetiacol (or *Paluisacol*) is the name given to a specific for tuberculosis, which is described as being

Cetylguaiacyl, a product obtained by the action of alcoholic soda or potash on guaiacol, and of the alkali compound of pyrocatechin so produced upon an excess of sperm oil. The purified substance is insoluble in water, but soluble in alcohol, ether, chloroform, etc., melts at 15° C., and is decomposed at its boiling-point. Its pharmacologic properties are the same as those of guaiacol, but it is claimed to be less irritant to the digestive organs.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1904), 1044.

Chevadol is the name given to an iodoform substitute which is composed of "terpiniodhydrate."

Chinolio is the name given to an Italian specialty composed of 80 parts of quinine sulphate and 20 parts of a mass of which the greater part is olive oil. It is an oily powder which is given in doses of five grains, as a substitute for quinine, mixed with wine or syrup.

Chloryl Anaesthetic is the trade-name given by a Scotch firm to the pure ethyl chloride exploited by them.

Cholelithmin "Marpmann" is the name given to a dilute alcoholic solution of the fresh bile of animals, which have been previously fed with fresh bile, and is recommended for the treatment of gall-stone colics.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Cholelysin is the name given to a specialty recommended as a remedy for gall-stone, and described as an intimate combination of sodium oleate and albumen. The liquid cholelysium contains 20 per cent. of sodium oleate and 2.86 per cent. of albumen.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 960.

Cinnamal is the trade name given by a London firm to a concentrated aromatic preparation made from Ceylon cinnamon, which is recommended as a prophylactic against influenza, etc.

Citon-Tablets, recommended as purgatives, are supplied in two forms, white and brown. The white tablets are claimed to contain 0.1 Gm. paraphthalein, 0.5 Gm. sugar, and 0.01 Gm. menthol; the brown tablets contain 0.002 Gm. vanillin, in place of the menthol, with the further addition of 0.1 Gm. of cacao.—Pharm. Ztg., *50*, No. 10 (Febr. 4, 1905), 1901.

Citraminum Oxyphenylicum, a white crystalline powder, soluble in 5 parts of water, is, according to Zernik, a mixture of equal parts of hetralin (resorcino-hexamethylenetetramine), and helmitol (anhydromethylene citrate of hexamethylentetramine).—Apoth. Ztg., *20*, No. 9 (Feb. 1, 1905), 74.

Citraminoxyphen is a new name given to "anhydromethylene citrate of hexamethylenetetramine," heretofore exploited under the name of Helmitol" (see Proceedings, 1904, 619).

Citronal Pills, a Bavarian specialty recommended in gout and rheumatism, are described as containing in 100 pills, 0.5 Gm. quinine hydrochloride, 10 Gm. citric acid, 6 Gm. extract of frangula, 4 Gm. extract of huckleberry leaves, with equal parts of powdered licorice and extract of licorice to make a mass. The pills are supplied chocolate-coated, and are to be given in doses of 5 pills, 3 times daily.—Pharm. Ztg., *49*, No. 91, No. 12 (Nov. 12, 1904), 969.

Codesol is a specialty, in the form of syrup, containing 2 per cent. of guaiacol and 0.2 per cent. of codeine, and recommended for coughs and other affections of the respiratory organs.—Pharm. Ztg., *50*, No. 11 (Mar. 11, 1905), 209.

Collaurin is the trade-name given to "colloidal gold," which is recommended in cancer, syphilis and scrophulous affections, given internally in doses of 0.03 to 0.06 Gm.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Corticin is the name now given to the quinine-caffeine preparation, prepared under a German patent, and formerly named "basicin."—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 960.

Cotargit is the name given to a double salt of cotarnine hydrochloride and ferric chloride, recommended as a hæmostatic. It is supplied in form of ruby-red crystals, which melt between 104° and 105° C.

Creosina Bosio is the name of an Italian specialty recommended in affections of the air-passages, which is said to contain 10 per cent. of creosote, retained in aqueous solution by the special process employed, and modified in its caustic properties by the addition of iodine, hypophosphites, and balsam of Peru.

Creosotina, a specialty of Italian manufacture, is claimed to be a derivative of creosote, combined, under special conditions, with benzoic acid in the presence of carbonic acid. It has an agreeable aromatic odor, seems to be well tolerated by the stomach, and possesses the antiseptic properties of creosote, without its unpleasant characteristics.

Curbilin-Chocolate is the name given to a worm remedy, composed of powdered pumpkin-seeds and chocolate.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Curaril is the name given to an active, stable and pure curare preparation of definite potency, which is recommended for subcutaneous injection in cases of tetanus. It is supplied in form of solution; the initial dose being 2.4 Cc., increased every 2 or 3 hours by 0.2 Cc. until the tetanic spasms are relieved. It has proven efficient, according to Bergell and Levy, not only in moderating, but in completely relieving tetanic attacks, if the dose established as explained is repeated every 4 hours until absolute relief is attained.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 760; from Therap. d. Gegenw., 1904, No. 9.

There appears to be some justifiable doubt, however, concerning the

high potency of curaril. According to R. Boehm, who is a well-known authority on the subject of curare, this preparation is in no way distinguishable from a filtered one-half-per-cent. solution of a curare that is not even particularly potent.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 960; from Therap. d. Gegenw., Nov., 1904.

Damholid is the name given to a hæmoglobin preparation which is supplied in three forms: 1. *Damholid liquidum*, containing 40 per cent. pure hæmoglobin and some phenol as preservative. 2. *Damholid I*, a granular, black-brown, odorless powder, soluble in 8 parts of cold water. 3. *Damholid II*, a fine, brown-red powder, somewhat less soluble that damholid I. Solution in either case is to be effected in cold distilled water.—Pharm. Rdsch., 1904, 459.

Deciquores is the generic name adopted for concentrated solutions of iron, manganese, etc., which are supplied for convenient dilution as required—1 part of the "deciquor" making 10 parts of "liquor," just as 1 part of "triquor" (see Proc., 1904, 633) makes 3 parts of the corresponding "liquor."—Pharm. Zlg., *49*, No. 90 (Nov. 9, 1904), 960.

Digalen is the name given to the so-called soluble digitoxin of Cloëtta, which is dissolved in water containing 25 per cent. of glycerin and 5 per cent. of alcohol, each Cc. containing 0.0003 Gm. of digitoxinum amorphum ($C_{28}H_{46}O_{10}$) and corresponding in its activity to 0.15 Gm. of digitalis leaves. It is exploited in sealed vials, the contents of which are to be used after opening within 14 days.—Pharm. Centralh., *46*, No. 2 (Jan. 12, 1905).

Digitalon is the name given to a digitalis preparation which, containing all the active constituents of the drug, is devoid of alcohol, non-irritant, aseptic, stable, and uniform in its potency. It is used hypodermically in doses of 0.5 to 1.0 Cc.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 2904), 760.

Digitalysalum is the name given to a German specialty which is said to be prepared from fresh digitalis leaves, collected on dry sunny days, and claimed to represent 0.7 Mgm. crude digitoxin in each Gm. (=1 Gm. fresh or 0.2 dry leaves). The preparation is recommended both for internal and subcutaneous use, in the maximum dose of 1 Gm., and not exceeding 5 Gm. daily.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

Digitoxinum Solubile is a digitalis preparation, which is claimed to be an efficient substitute for digitalis infusions and other digitalis preparations, in subcutaneous doses of 0.3 milligrams. The method of its preparation has not been published.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675.

Dimopxyranum is the name by which a specialty identical with "pyramidon" (amidopyrin) is exploited.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Divinal is the name given to a compound recommended as an addition

to baths, for the treatment of gout, rheumatism, nervous and female ailments. According to the analysis of Professor Willstein, it has the following composition: Silicic acid (SiO_2), 31.12 per cent.; alumina (Al_2O_3), 4.39 per cent.; iron (Fe_2O_3), 7.20 per cent.; lime, as CaO, 29.99 per cent.; lime, as carbonate, 53.44 per cent.; magnesia, as MgO, 1.85 per cent.; magnesia, as carbonate, 3.87 per cent., = 100.02 per cent.—Pharm. Ztg., *49*, No. 96 (Nov. 30, 1904), 1022.

Duran is the name given to a specialty composed of the carbonates and phosphates of calcium and magnesium in combination with albumen, and recommended for the treatment of rhachitis and similar ailments, particularly in children. It is supplied in form of a white powder and also in form of chocolate tablets.—D. Med.-Ztg., 1904, No. 87.

Durana is the name given to gutta-percha plaster mulls and gauzes, prepared on the principle suggested by Dr. Unna.

Emulgates is the generic term proposed by Dr. Leopold Sarason for a solid form of emulsions of fixed and volatile oils, which, though containing as much as 50 per cent. of the oil, are produceable in the form of a permanent light powder having a relatively pleasant taste, and conveniently taken in divided doses, either dry on the tongue, or enclosed in cachets. The emulsification of the oil is effected by means of the nutrient (albuminoid) preparation introduced by Dr. Sarason in 1899 under the name of "Roborat" (see Proceedings, 1901, 643). This, being present to the amount of 50 per cent., adds to the pharmacologic value of the medicinal oil, the nutrient effects of the albuminoids composing it.—Pharm. Ztg., *49*, No. 92 (Nov. 16, 1904), 978.

Endermol (not to be confounded with "Eudermol," which contains nicotine salicylate), is the name given to an ointment base, composed of stearine anilide and hydrocarbons of the paraffin series. It is a readily absorbable non-irritant substance, and appears similar in its composition to the ointment base exploited under the name of "fetron."—Pharm. Ztg., *50*, No. 10 (Feb. 4, 1905), 101.

Enesol is the name given to a salicylarsinate of mercury, which is obtained by the action of a molecule of methylarsinic acid upon a molecule of basic mercuric salicylate. It is described as a white, amorphous salt, soluble to the extent of 4 per cent. in water, and capable of being sterilized in each solution without undergoing decomposition. It fails to give reactions for either arsenate or mercury, is not precipitated by ammonium sulphide or potassium iodide, but contains 38.46 per cent. of mercury and 14.4 per cent. of arsenic. Physiologically, enesol is less toxic than its components, but it is claimed to unite the well-known action of mercury with the tonic effect of arsenic in cases of syphilis, for the treatment of which it is recommended. Injections of enesol are painless.—Pharm. Ztg., *49*, No. 57 (July 16, 1904), 598; from Bull. Commerc., 1904, No. 6.

Ensemin is the name given by Rosenberg and Wohlauer to a local anesthetic, which has been used with advantage for the "painless" extraction of teeth. It is said to consist of a 1-per-cent. solution of cocaine, to which certain quantities (not stated) of adrenalin and chloretin are added. —Pharm. Ztg., *49*, No. 96 (Nov. 30, 1904), 1022.

Ermüdungs-Antitoxin (*Exhaustion-Antitoxin*) is the product of experiments by W. Weichardt, who succeeded in isolating a toxin from the muscles of animals which had become completely exhausted, and immunizing horses with this toxin in the usual manner. The serum obtained is purified from accompanying albumin, etc., and reduced to a permanent and dry form by evaporation in a vacuum. It is described as an efficient invigorant in convalescence, and particularly useful for restoring and imparting strength to persons fatigued from violent exercise, and is claimed to be readily absorbed into the system, and to be absolutely nontoxic.—Münch. Med. Wschr., 1904, No. 48.

Ester Dermasan is the name given to a new superfatted medicinal soap, containing 10 per cent. of benzoyl salicylic acid-ester, and 10 per cent. of phenylic acid-ester. It is recommended for the treatment of chronic rheumatism, etc.

Etacol is the trade-name given to ethyl morphine sulphoguaiacolate. It must not be confounded with

Ethacol, which is the ethyl-ester of pyrocatechin.

Eudrenin is the trade-name of a specialty composed of β-eucaine and adrenalin hydrochloride in solution, suitable for injections in dentistry and minor surgery as a local anæsthetic.

Euporphine, the bromomethylate of apomorphine (see Proceedings 1904, 615), which is recommended in the treatment of eye diseases, is characterized by F. Zernik as follows: White or yellowish-white crystalline leaflets, very easily soluble in water, forming neutral solution; readily soluble in alcohol, but scarcely soluble in ether or chloroform. In moist air, particularly under exposure to light, its solutions are gradually browned. The aqueous solution is turned blood-red by chlorine water. If 2 Cc. of a saturated solution of sodium nitrite is added to a solution of 0.01 Gm. of euporphine in 2 Cc. of water, the mixture assumes a white turbidity; if then 5 drops of acetic acid are added and the mixture vigorously shaken, a transient blood-red color is produced, followed by the formation of an orange-yellow precipitate, which is soluble in excess of the acid with the same color. The aqueous solution should be colorless or barely brownish. Euporphine should leave no residue or incineration; its maximum single dose is 0.02 Gm., daily dose 0.06 Gm.—Apoth. Ztg., *29*, No. 74 (Sept. 14, 1904), 720.

Euprotan is the generic name given to albumen preparations obtained under a German patent from blood, which are exploited under the desig-

nations α- and β euprotan as cheap and efficient nutrients for the masses. —Pharm. Ztg., *50*, No. 10 (Febr. 4, 1905), 101.

Eutannin is described as being a substance closely related to tannin, which is insoluble in the fluids of the stomach but become active in the intestines, where it splits off tannin. Its therapeutic uses are obvious. It is supplied mixed with an equal weight of milk-sugar, and is given in doses of 0.25 to 0.75 Gm.—Pharm. Ztg., *50*, No. 24 (March 25, 1905), 2949.

Fercao is a ferruginous diatetic mixture, of Norwegian manufacture, essentially composed of sacaharate of iron and cacao.—Pharm. Ztg., *49*, No. 82 (Oct. 12, 1904), 876.

Fermaltine is the name given to a German specialty composed of iron, quinine, and malt-wine.

Fermangol is the name given to a specialty containing 0.5 per cent. of iron, 0.1 per cent. of manganese, in aromatic solution with glycerophosphoric acid, sugar, etc.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726.

Ferrocolin is a mixture of peptonated guaiacol-iron albuminate with thymol syrup, recommended for scrofula, incipient tuberculosis, bronchial catarrh, whooping cough, chlorosis and anaemia.—Pharm. Ztg., *50*, No. 15 (Feb. 22, 1905), 159.

Fetrosal is the new name for an ointment, heretofore exploited under the name Velosan.

Fibrolysin is the name given by Mendel to thiosinamine combined with one-half a mol. of sodium salicylate, in order to render it soluble in water and thus facilitate its subcutaneous application, which has heretofore been possible only in alcoholic solution. It is supplied in solution of 1.5 p. fibrolysin in 8.5 p. of water, in sealed vials containing 2.3 Cc. of the solution, sterilized at 115° C., and representing 0.2 Gm. of thiosinamine. Subcutaneous injections made with this solution are painless, and are quite as efficient as a tissue solvent in lupus, chronic glandular tumors, sclerodermic affections, etc., as thiosinamine by itself.—Therap. Monatsh., 1905, No. 2.

Filmaron oil is claimed to be a convenient form of exhibiting "filmarin," the active constituent of male fern (see Proceedings 1903, 719), which has a tendency to cake in the dry condition, and thus causing considerable trouble and loss in dispensing. It consists of a solution 1 : 10 in castor oil.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Fluinol (*Fluorpinol*) is an alcoholic fluidextract of pine and fir needles mixed with some volatile oils, and recommended as an addition to baths, gargles and washes, and for inhalations and nebulizations in the treatment of various affections.—Pharm. Ztg., *50*, No. 3 (Jan. 11, 1905), 30.

Formatine is the name of a specialty, recommended as being particularly valuable in catarrh of the bladder, dysmenorrhœa, etc. It is de-

scribed as a fluidextract obtained from certain hymenomycetic ferments (*cinnamomens* and *igniareus*) found growing on a tree of the *Prunus* family, and is supplied in form of a clear, reddish-brown liquid, having an odor of mushrooms, and a bitter taste.

Formaldehyde-Thiolin is the coined name of a Swiss ichthoform substitute.—Pharm. Ztg., *50*, No. 33 (April 25, 1905), 352.

Forminal is the name given to a Parisian specialty recommended for the treatment of *fluor albus* and similar affections, which according to "Pharm. Centralhalle" is supplied in the form of a pleasantly odorous emulsion, and evidently contains formalin.

Formosapol is a specialty exploited in Germany, which is said to have the same composition as "lysoform."

Fucol-Malt Extract is a specialty composed of equal parts of malt extract and "fucol," the latter being an oily extraction of *Fucus vesiculosus* and other sea *Algae* in some bland fixed oil, such as benne- or groundnut oil. The preparation (emulsion) is recommended as an agreeably tasting substitute for cod-liver oil.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 499.

Gallogen, which is claimed to be composed of ellagic acid, has been subjected to chemical examination by K. Alpers, who describes it as follows: A greenish-grey powder, composed of very finely divided, but very impure ellagic acid, 2 Gm. yielding ¼ Gm. of crystallized ellagic acid, which still contained impurities. The impurities doubtless consisted of extractive substances from the galls from which the gallogen was prepared.—Pharm. Ztg., *50*, No. 16 (Feb. 25, 1905), 167.

Gelapepsin is the name given to a 1 or 2 per cent. solution of gelatin in physiological salt solution.

Glidin is the name given by Dr. Volkmer Klopfer to a preparation of wheat, which is claimed to contain 96 per cent. of albumen, 1 per cent. of salts, and 1 per cent. lecithin. It is a tasteless and odorless powder, which swells up when steeped in aqueous fluids, and is recommended as an addition to the food of diabetics and nephritics—the adult doses being two to three tablespoonfuls.—Pharm. Ztg., *49*, No. 82 (Oct. 12, 1904), 876.

Glycophal is a compound syrup of the glycerophosphates of calcium, sodium, potassium, magnesium and iron, containing also pepsin and diastase. It is also supplied in combination with extract of malt or with hæmoglobin.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Goldhammer Pills, exploited as a disenfectant remedy in all forms of intestinal catarrh, are composed of Bismuth Salicyl., 0.10; Ol. Menth. Mitch., 0.07; Rad. Rhei, Fr. Caroi., āā 0.03; Carbon. veg., 0.04; Extr. Gent., 0.05; Gelatin, 0.02.—Pharm. Ztg., *50*, No. 22 (March 18, 1905), 228.

Gonoryl Tablets, recommended in dose of 8 tablets per day in gonorrhœa, are stated to contain 33 per cent. of "Ranjan," a new East Indian drug which, according to Hartwich, is derived from *Ixora coccinea* (Rubiaceæ). The root and branches of this drug are employed as a remedy in dysentery, fever and gonorrhœa.—Pharm. Ztg., *50*, No. 7 (Jan. 25, 1905), 71.

Gondrogénine is the name given to a dry form of wood-tar prepared from coniferous wood. It is supplied in form of brown splinters or scales, which are readily and completely soluble in water, forming according to Goris a solution possessing all the properties of tar water, including its bactericidal properties.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 793; from Bull. der Sc. Pharm., 1904, No. 8.

Graminin is the name given to a serum which is recommended for the relief of hay-fever.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726.

Griserin, a specialty recommended in tuberculosis and other infectious ailments, has been determined by Dr. F. Zernik to be a mixture of "loretin" with 4.25 per cent. of sodium carbonate or, as is more probable, 6.75 per cent. of sodium bicarbonate.—Apoth. Ztg., *19*, No. 92 (Nov. 16, 1904), 908.

Guakalin is the name given to a preparation containing potassium sulphoguaiacolate as its active medicinal constituent.

Guayarsin is the name given to a guaiacol compound with arsenic which is claimed to be comparatively non-toxic. It is supplied in the form of

Guayarsin Syrup, containing in 10 Gm. the equivalent of 0.005 Gm. of arsenic and 0.2 Gm. guaiacol, with certain quantities of chlorhydrophosphate of calcium and cinnamic acid.—Pharm. Ztg., *49*, (Aug. 27, 1904), 726.

Hæmoantitoxin is the name given by Maraglianos to a tuberculose-antitoxin, which is supplied in admixture with glycerin and aromatics. It is a clear, wine-red liquid, having an agreeable taste, the sp. gr. 1.016, a neutral reaction, and is not changed at temperatures ranging from 0° to 35° C. The preparation is particularly recommended as a prophylactic, and is administered in daily doses of 4 tablespoonfuls before meals.—Münch. Med. Wschr., 1904, No. 26. Pharm. Ztg. *49*, No. 57 (July 16, 1904), 599.

Hæmorrhoisid is the name given to tablets, recommended for the treatment of piles, which are said to be composed of 6.45 *Extr. Pantjason* (?), 3.55 Cacao, deprived of oil, and 5.0 Sugar. Pharm. Ztg. *50*, No. 7 (Jan. 25, 1905), 71.

Hæmostypticum Brüninghausen is a fluidextract prepared from 2 parts of Ergot and 1 part of Hydrastis by a special process, with alcohol, ether and glycerin, recommended in hæmorrhages in doses of 30 drops.—Allgem. Med. Zentral. Ztg., 1805, No. 15.

Heritin "Marpmann," not to be confounded with the alkaloid "heretine," from *Heritiera japonica*, is explained to be a preparation of certain organs of animals which have been treated with an ethereal extract of heritiera root. Particulars of the method of its preparation are not given. It is described as a colorless solution, containing 45–46 per cent. of alcohol, without characteristic taste or odor, and yielding a small solid residue on evaporation, which is apparently composed of the alkaloid "heretine" with small quantities of albuminoid and mineral matter. It is recommended in doses of 5 to 10 drops for headaches, nervousness, insomnia, etc., induced by anaemic conditions. Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Heuriettol is the name given to a specialty, supplied in tablets composed of "creosoto-calcium oxysulfuratum," and recommended in tuberculosis. The preparation generates H_2S in the organism, which, it is claimed, destroys the virulence of the tubercular bacilli, while the CaOCl formed raises the alkalinity and resistance of the blood.—Pharm. Ztg., *50*, No. 24 (Mar. 25, 1905), 249.

Hippol is the name given to methylene-hippuric acid, which Dr. A. Nicolaier has found useful as a urinary antiseptic in the treatment of bacterial affections of the urinary organs, its effectiveness depending on the ease with which the acid—or more correctly "ester"—splits off formaldehyde.

Methylenehippuric Acid ($C_6H_5CO–N–CH_2–COO–CH_2$) forms colorless, prismatic crystals; m. p. 151° C., odorless, tasteless, sparingly (1 : 460) soluble in water, readily soluble in chloroform, and also in warm benzol, acetic ether and alcohol. It is non-toxic, and has been given by Dr. Nicolaier with good results in doses of 1.5 Gm. four times daily.—Therap. Monatsh., 1905, No. 1.

Histosan is the name given to a specialty recommended for the treatment of tuberculosis. It is supplied in form of powder, which is given in doses of 0.25 to 0.5 Gm. three or four times a day, and in the form of syrup, given at the same intervals in teaspoonful to tablespoonful doses. The essential component of these preparations is said to be a compound of guaiacol and albumen.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675.

Hyperbiotin is the name given to an Italian specialty, which is claimed by its exploiter to be a fluid-extract of meat, prepared from the heads of perfectly sound animals.

Hysterol is the name of a specialty consisting of gelatin pearls, each containing 0.25 Gm. of bornyl valerianate, and recommended as a substitute for the ordinary valerian preparations.—Tidsskr. f. Kem. u Farm., 1905, No. 10.

Ichden, designated in all other countries as "piscarol" by the Swiss manufacturer, is exploited in Germany under the first name as a substitute for ichthyol. It has been authoritatively examined, and is described as

possessing the same physical and chemical properties as the official (Swiss and G. P.) ammonium ichthyolsulphonate.—Pharm. Ztg. *50*, No. 13 (Feb. 15, 1905), 135.

Indoform is the name given to "salicylic acid methyleneformaldehyde," obtained by the action of formaldehyde on acetylsalicylic acid. It is a white powder, having an acidulous astringent taste, m. p. 108°–109° C., difficultly soluble in cold water, more readily in hot water. It is saponified in the intestinal tract, giving off formaldehyde, upon which its therapeutic efficiency depends, and is recommended in gout, ischias, and neuralgias, in doses of 1 to 3 tablets, each containing 0.5 Gm., during or immediately after meals.—Pharm. Ztg. *50*, No. 31 (April 19, 1905), 327.

Iodalia is the name given to an iodo-tannin preparation, representing 1 grain of iodine in each fluidrachm, having a pleasant taste, and said to be stable under ordinary conditions. It is recommended as a remedy in intensive iodine medication, applicable in all cases when iodine is indicated because of freedom of the harmful and unpleasant after-effects usually following the administration of iodine or potassium iodide. The adult dose is from 2 drachms to half a fluidounce.

Iodgelatin is recommended by Bruschelli as an efficient and acceptable iodine preparation designed for internal exhibition. It is obtained by heating on a water-bath, under constant stirring, 3 Gm. of gelatin, 2 Gm. of potassium iodide, 1.2 Gm. of iodine, 2 Gm. of sodium hypophosphite, 2 Gm. of calcium hypophosphite, and 100 Gm. of water, until the gelatin is completely melted, then filtering the solution, which becomes clear and is colorless.—Pharm. Ztg., *49*, No. 57 (July 16, 1904), 599; from Bollet. Chim. Farm., 1904, No. 11.

Iodlecithins are prepared under a German patent by treating lecithin with iodine monochloride, or with mixtures which will give off the latter, the percentage of iodine content depending on the amount of iodine monochloride used. The ordinary kind contains from 7 to 8 per cent. of iodine. It is a brownish-yellow mass, of a waxy consistence, and not distinguishable appreciably from lecithin itself. The iodlecithins are readily soluble in ether and warm alcohol, but simply swell up with water forming slimy mixtures similar to those produced by lecithin. By treatment with alkalies, they are split up into cholin, glycerophosphoric acid, and iodized fatty acids.—Pharm. Ztg., *49*, No. 91 (Nov. 12, 1904), 969.

Iodoline is the trade-name given to bismuth iodosalicylate, which is proposed as a substitute for iodoform. It is described as a fine, light-grey, stable powder, inodorous, non-toxic and non-irritant.

Iodor is the trade-name given to a liquid preparation containing iodine in organic combination, which, it is claimed, is free from the unpleasant after effects, such as iodism or gastric troubles, following the use of the ordinary iodine preparations.

Iothion is the name given to "diiodohydroxypropane," which is described as a yellowish, oil-like, heavy fluid (sp. gr. 2.4-2.5), soluble in water (1 : 75–80), in glycerin (1 : 20), in olive oil (1 : 15), but miscible with alcohol, ether, chloroform, benzol, vaselin and lanolin, in all proportions. It is moderately volatile at the body temperature, and, containing 79–80 per cent. of iodine, is proposed as a valuable agent in iodine therapy, being rapidly absorbed by inunction to the amount of 50 per cent. It is not identical with the iothion described in last year's report (see Proceedings, 1904, 621), which is no longer supplied.—Therap. Monatsh., 1905, No. 4.

Isoform is the trade name given to *p*-iodanisol ($C_6H_4.OCH_3–IO_2$) obtained from iodanisol by oxidation. It forms silvery-shining scales, is insoluble in alcohol and ether, difficultly soluble in cold water, but more readily in hot water and in dilute acetic acid. At 225° C. it is decomposed with explosive violence. It is recommended as a superior antiseptic and as a substitute for iodoform. It is supplied in the form of 1 per cent. to 10 per cent. gauze ; as wound-powder, mixed with an equal weight of calcium phosphate ; in the form of paste prepared with an equal weight of glycerin ; and in form of capsules intended for internal use.—Pharm. Ztg., *49*, No. 79 (Oct. 1, 1904), 842.

Isson is the name given to a specialty containing 0.2 per cent. of iron saccharate ($C_{12}H_{22}O_{11}FeO$), which is recommended as being an agreeable tasting, permanent and efficient ferrugenous preparation. It is given in 10–25 drop doses to children, and half to one teaspoonful doses to adults. —Pharm. Ztg., *49*, No. 79 (Oct. 1, 1904), 843.

Itrol Credé pro Oculis is the trade designation given to silver citrate, reduced to extremely fine powder, which does not cake (so that it may be readily projected from the fine hairs of a camel's hair pencil). It is supplied by the manufacturer in black, sealed vials containing 0.5 and 1 Gm., with the advice that after opening the vial it is to be well corked and preserved in a black bottle of 500 Gm. capacity closed with a ground glass stopper lubricated with vaselin. So preserved the powder will keep 2 or 3 weeks, but if the vial is frequently opened, it is not to be used after two weeks. These precautions are necessary because of the ease with which the silver citrate is decomposed by air and light, as well as by the acetylene produced during the combustion of illuminating gas.—Pharm. Centralh., *46*, No. 11 (Mar. 16, 1905), 212.

Kaloderma, a cosmetic jelly, claimed to be composed of "glycerin and honey," and recommended by its exploiters for sunburn, freckles, roughness of the skin, etc., is according to the "Pharm. Zeitung" a mixture of glycerin, sugar and a little potash soap.

Karola—Gout Water, a Dutch specialty, is described as being an artificial alkaline water of complicated composition, containing among the

other components, 0.8 Gm. lithium benzote, and 0.005 Gm. of sodium fluoride.—Pharm. Ztg., *50*, No. 18 (March 4, 1905), 190; from Pharm. Weekbl., 1905, No. 8.

Kephalopin is the name given to a cold oily extraction of the fresh brain substance, which is non-toxic, and may be administered both *per os* and subcutaneously. It is prepared with olive oil, and is intended to replace the prepararation of the brain substance heretofore recommended and in use, having the advantage of great stability over those, while presenting the active constituents of the nerve substance. It is given in doses of 2–5 Cc. in neurasthenia, hysteria, neurosis, cerebral neuralgia, neuralgia, and, particularly in epilepsy.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 577; from Munch. Med. Wschr., 1904, No. 26.

Keramin Soap is the name given by Unna to a sodium and potassium soap, medicated with balsam of Peru, and perfumed with the oils of cloves and cinnamon. In addition to its powerful saponaceous qualities it is advantageously used as a disinfectant and deodorant in the treatment of skin diseases, and particularly efficient for the relief of itching in such cases.—Monatsh. f. pr. Dermat., 1904, 73.

Kleiolin, a name evidently derived from "Kleie" (bran), is said to be a concentrated solution of the constituents of bran, which is recommended as an addition to bath water. According to the "Med. Korrespondenz-blatt," it operates as a sedative to the skin, giving it softness and pleasantness of feeling.

Laxan is the name given to a specialty in tablet form, each containing 0.1 Gm. of phenolphthalein and 0.3 Gm. of vanilla chocolate.—Pharm. Ztg., *50*, No. 29 (April 12. 1905), 308.

Laxatol, evidently a similar specialty, is also exploited in form of tablets. —*Ibid.*, *50*, No. 33 (April 26, 1905), 351.

Lecin is a neutral iron albuminate solution, containing 0.5 per cent. of iron, of agreeable taste, and of unlimited stability, which is claimed to possess advantages over the preparations of ferric albuminate ordinarily supplied.—Pharm. Ztg., *50*, No. 40 (May 20, 1905), 421.

Lecithan is the name given to a lecithin supplied by a Swiss firm, and is described as being a wax-like hygroscopic substance in the formation of which phosphoric acid, higher saturated and unsaturated fatty acids, nitrogenized groups, and glycerin are concerned.—Pharm. Ztg., *49*, No. 79 (Oct. 1, 1904), 843.

Lecithinogen, recommended for the most variable forms of disease, is said to be composed of 90 per cent. of "liquor calcii aethyl. hypophosphor.," and 10 per cent. of cane sugar.—Pharm. Ztg., *50*, No. 18 (1905), 190.

Lecitogen is another name for "Jaffe's Lecithin-Cacao," which, accord-

ing to Pharmaceutische Centralhalle is supplied in doses containing 3 Gm. lecithin mixed with pure cacao.

Lemontea, a golden-brown tea of agreeably aromatic-acidulous taste, is prepared by a peculiar method of drying the inner substance of lemons, deprived of seeds, without loss of juice (acid) nor injury to the aroma. It yields an agreeable beverage, designed for the so-called lemon-juice treatment.—Pharm. Ztg., *50*, No. 15 (Feb. 22, 1905), 159.

Lentin is the name given to an antidiarrhœicum for children, which is composed of hydrochloride of metaphenylendiamine.—Pharm. Ztg., *50*, No. 18 (Mar. 4, 1905), 190.

Letalbin is the name given to a lecithin preparation, containing besides albumen, 20 per cent. of pure lecithin, and recommended as a general tonic.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Leukrol is the name given to a specialty, exploited in the form of fluid extract and pastilles as a remedy for fluor albus, and said to be prepared from a tropical plant of unknown commercial and botanical origin.—D. Med. Ztg., 1905, No. 2.

Lévurargyre is the name given by Trillat to a nucleine mercurate obtained from beer yeast, in which it is formed by the successive addition of mercuric chloride during its cultivation. The yeast so treated is washed, dried, and then digested with faintly alkaline water, which extracts the nucleo proteid formed. Obtained in this way, lévurargyre contains mercury in similar combination to the nucleine mercurate heretofore introduced under the name of "mercurol," over which it is claimed to have the advantage of being free from metallic taste, and of not being attacked by sulphuretted hydrogen. It is said to prove serviceable in the treatment of syphilis. Trillat has in a similar way obtained the nucleo proteids of iron, manganese, vanadium, silver, arsenic, fluorine, iodine and bromine. —Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 653.

Linimentum Carragheni is the name given to a salve-like, water-soluble mass, recommended as a substitute for vaselin and oils, and prepared, as its name indicates, from Irish moss. According to Wille, antiseptics retain their activity unimpaired when mixed with this preparation.—Pharm. Ztg., *50*, No. 10 (Febr. 4, 1905), 101; from Ztschr. Oesterr. Ap.-Ver.

Lintanel is the name given to a new bandaging material, which is claimed to possess the ability to absorb large quantities of fluid in a comparatively small volume.—Pharm. Ztg., *50*, No. 43 (May 31, 1905), 455.

Liquor Haemino-albuminatus is the name given by Bedall to a specialty intended to replace haemalbumin. It is described as a pleasant-tasting liquid, obtained by dividing 30.0 ferralbumin (R. Harras) in 652.0 lukewarm water, and flavoring this solution with 5.0 tincture of vanilla, 10.0 arak, 2.0 spirit of nitrous ether, 0.2 cumarin sugar (1 : 1000), 0.4 bitter

almond oil sugar (1 : 50) and 0.4 rose oil sugar (1 : 50), previously mixed with 100.0 alcohol and 200.0 sugar syrup.—Pharm. Centralh., *45*, No. 49 (Dec. 8, 1904), 916.

Lofotin is the name given to a so-called "hydroxyl-free" cod-liver oil. It is supplied also with the addition of 0.01 per cent. of phosphorus.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 960; from Pharm. C. H.

Magnesium perhydrol is the trade name given to a preparation of magnesium peroxide, a white powder, insoluble in water, composed of 15–25 per cent. of MgO_2 and 75–85 per cent. of magnesia (MgO). It is recommended in doses of 0.5 to 1 teaspoonful in water, before or after meals, in abnormal fermentative condition of the stomach and intestines.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Malto-ferrin and *Malto-pepsin* are two Austrian specialties. Malto-ferrin contains 22.87 per cent. of maltose, 13.9 per cent. of albuminoids, 4.99 per cent. of iron, and 3.34 per cent. of phosphorus. Malto-pepsin contains 40.76 per cent. of maltose, and a quantity of pepsin corresponding to 0.1 Gm. in 1.3 Gm. of the preparation.—Pharm Ztg., *50*, No. 50 (June 24, 1905), 529.

Maretine is the name given to the carbaminate of meta-tolylhydrazine. It is a white, tasteless, crystalline powder, almost insoluble in cold water (1 in 1,000), more soluble in hot water (1 in 50), and alcohol (1 in 100). Melting-point, 183–4° C. It is an antipyretic, which is specially indicated in tuberculosis; but it also rapidly reduces the temperature in typhoid fever, influenza, neuralgia, and the other cases where antipyretics are used. It seldom produces sweating, and causes no gastric or circulatory disturbance. The dose is 3 to 5 grains, with a maximum daily dose of 15 grains.—Nouv. Remèdes, 1905, *21*, 155.

Marina is the name given to filtered sea-water (from the Mediterranean), impregnated with carbonic acid under a pressure of 10–12 atmosphere, and recommended for the treatment of dysentery, dyspepsia, and diabetes mellitus, and as a gentle aperient, in doses of ¼ to ½ glassful.—Wien. Med. Pr., 1904, No. 47.

Medullin is the name given to a specialty, recommended in asthma and pulmonary affections. It is said to be composed of 500 Gm. cod-liver oil; 250 Gm. honey; 62 Gm. Peru-cognac; 70 Gm. extract of black currant leaves; 50 Gm. extract of juniper berries, and 18 Gm. lemon juice.—Pharm. Ztg., *50*, No. 13 (Febr. 15, 1905), 135.

Melioform is a colored disinfectant fluid, stated to contain, besides 25 per cent. of formalin, 15 per cent. of aluminum acetate, with several other indifferent substances, that guarantee the stability of the preparation. For use, it is diluted with 250 times its water (4 Gm. to 1 liter).—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Mercuriol-Oil is the name given to a mixture of equal parts of mercuriol (magnesium-aluminum-amalgam), lanolin and almond or olive oil, and in this form is employed by injection.—Wien. Med. Pr., 1904, No. 49.

Metakalin Tablets represent cresol soap in solid form, each tablet containing 1 Gm. of cresol soap. They possess the advantage of convenient dosage, with ready solubility in cold or warm water. Pharm. Ztg., *50*, No. 15 (Febr. 22, 1905), 159.

Metaphenylendiamine Hydrochloride is recommended by Dr. Unverricht as an antidiarrhœic, in doses of 0.01 Gm. to young children, or 0.1 Gm. to adults, three times daily. The watery stools soon give way to firm evacuations and their frequency is rapidly diminished after the administration of the remedy.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 577; from Münch. Med. Wsch., 1904, No. 27.

Metharsinat is the name that has more recently been given to *Sodium methylarsinate*, which has for several years been supplied in France under the names of "Arrhénal" and "Néoarsycodile." It is given subcutaneously in quantities of 0.05 to 0.1 Gm. per day, or internally in doses of 0.025, in tuberculosis, swamp fever, vomitus gravidarum, skin diseases, etc.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 961.

Mitin is the name given to new ointment base, which is described as being "a superfatted emulsion of fats in a serum-like fluid incorporated with non-emulsionized fat to form a mass of ointment consistency. It is supplied in a variety of combinations and forms, such as "creme" paste, etc.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 820; from D. Med. Wschr., 1904, No. 38.

Mucol, a salicylic acid solution (1 : 30) in alcohol and glycerin, containing also some menthol, is recommended as being very efficient in the treatment of infectious mouth and throat affections.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

Müglitzol is a specialty recommended for foot-sweat, containing a formaldehyde-producing compound of formaldehyde and a body obtained from bituminous shale (ichthyol?).—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Muiracithin is the name given to silver-coated dragees, which are recommended for all forms of neurasthenic ailments, particularly sexual neurasthenia, and impotence depending on nervous debility. It is said to be a compound of an extract of *Muiræ Puamæ* (obtained from *Acanthea virilis*, a Brazilian acanthacea) and ovo-lecithine.—Pharm. Ztg., *50* No. 10 (Feb. 4, 1905), 101.

Muscolosine is the name of a French specialty which is said to be a pure and stable "muscle juice."

Naftalan, which is a combination of the higher boiling portions of Cau-

casus naphtha (petroleum) with soap, has been prepared by Kupzis from the naphtha residues having a sp. gr. 0.94–0.97, and deprived of odor by vacuum distillation, by dissolving from 6 to 8 per cent. of perfectly neutral stearine soap in it. The product is not distinguishable from the commercial naftalan.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 499; from Farmaz. Jour., 1905, *44*, 527.

Narcoform is a mixture, resembling somnoform, composed of 60 per cent. of ethyl chloride, 35 per cent. of methyl chloride and 5 per cent. of ethyl bromide, and is recommended for anaesthetic purposes.—Pharm. Ztg., *50*, No. 43 (May 31, 1905), 454; from Pharm. Weekbl.

Natrium Bromo-valerianicum is a French specialty, not definitely described, recommended as a nerve remedy in doses of 0.25 Gm., given in solution 1 : 10, or in capsules, claimed to be efficient in epilepsy, hysteria, palpitation of the heart, etc., and also in chorea, neurasthenia and migrane. —Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Nebulates are a new class of specialties intended particularly in a "nebulizer" of special construction, introduced by a Berlin firm of manufacturers, under the name of "nebulor," for office use in the treatment of affections of the throat, lungs, ears, nose, etc. Obviously, these nebulates may also be used in the spray and nebulizing apparatus of ordinary construction, and the formulas given may therefore find place here under their specific names and number:

No. 1. Mezi: 1.5 Gm. oil of eucalyptus; 0.10 Gm. oil of cinnamon; 1.2 Gm. menthol; 4.0 Gm. balsam of Peru; 4.0 Gm. balsam of tolu, and 4.0 Gm. myrrh; absolute alcohol, sufficient to make 100.0 Gm. of liquid. *Use:* In simple catarrh of the nose, throat and trachea.

No. 2. Mekamco: 1.8 Gm. menthol; 1.8 Gm. camphor; 0.9 cocaine hydrochloride; 4.0 Gm. each of balsam of Peru, balsam of tolu, and myrrh; digested with sufficient absolute alcohol to make 100.0 Gm. of liquid. *Use:* In violent inflammations of the throat and trachea, in diphtheria and in pulmonary consumption.

No. 3. Pijokreo: 0.09 Gm. oil of cloves; 1.5 Gm. beechwood creosote; 1.5 tar; 1.8 iodine; 4.0 Gm. each of balsam of Peru, balsam of tolu and myrrh; enough absolute alcohol to make 100.0 Gm. of liquid. *Use:* In pulmonary and laryngeal consumption.

No. 4. Iotan: 1.8 Gm. tannin; 1.8 Gm. iodine; 4.0 Gm. each of balsam of Peru, balsam of tolu and myrrh; enough absolute alcohol to make 100.0 Gm. fluid. *Use:* In chronic catarrh of the nose, throat and trachea.

No. 5. Chibromanco: 3.1 Gm. quinine hydrobromide; 1.5 Gm. camphor monobromate; 0.9 Gm. cocaine hydrochloride; 0.9 Gm. antipyrine; 4.0 Gm. each of balsam of Peru, balsam of tolu and myrrh; sufficient

absolute alcohol to make 100.0 Gm. of liquid. *Use:* In asthma, whooping cough, hay fever, acute inflammation of the trachea, etc.

No. 6. Meniocar: 1.2 Gm. iodine; 1.2 Gm. liquid carbolic acid; 3.1 Gm. menthol-camphor; 1.5 Gm. acetic ether; 3.1 Gm. oil of sassafras; 5. Gm. cacao-fat; 10 Gm. toluol; 85. Gm. liquid petrolatum. *Use:* In ear, nose and throat catarrh.

No. 7. Mezico: 0.1 Gm. oil of cinnamon; 3.1 Gm. menthol-camphor; 0.5 cocaine hydrochloride; 5.0 Gm. cacao-fat; 85.0 Gm. liquid petrolatum. *Use:* In throat pain and violent colds of the upper air passages.

No. 8. Pizikreo: 1.2 Gm. oil of cloves; 0.1 Gm. oil of cinnamon; 1.5 Gm. beechwood creosote; 1.5 Gm. distilled coal-tar oil; 5.0 Gm. cacao-fat; 10.0 Gm. toluol; 85.0 Gm. liquid petrolatum. *Use:* In tuberculosis of the lungs and throat.

No. 9. Iodcartan: 5.1 Gm. iodine; 13.7 Gm. potassium iodide; 8.6 Gm. tannin; 4.2 Gm. liquid carbolic acid and 70.0 Gm. of a liquid obtained by macerating 5 Gm. of carragheen; 5 Gm. Iceland moss; 10 Gm. water, and 90 Gm. glycerin. *Use:* In chronic catarrh of the throat, inflammation of the larynx, and scrofulous glandular swelling.

No. 10. Aldesar: 1.7 Gm. 40 per cent. formaldehyde solution; 4.6 Gm. compound fluidextract of sarsaparilla; 18.9 of liquid prepared from carragheen (5 Gm.), Iceland moss (5 Gm.), water (10 Gm.) and glycerin (90 Gm.), as under No. 9 (which see), and water 75 Gm. *Use:* In diphtheria and tonsilitis.

No. 11. Chlorbromeco: 1.2 Gm. chloretone; 0.8 Gm. camphor monobromate; 0.7 Gm. menthol-camphor; 1.8 Gm. cocaine hydrochloride; 0.8 Gm. oil of anise; 0.8 Gm. oil of bitter almond, and sufficient of a mixture of 5 Gm. cacao-fat, 10 Gm. toluol and 85 Gm. liquid petrolatum to make 50 Gm. of liquid. *Use;* In asthma, bronchitis and whooping-cough.

No. 12. Chloriokreo: 3.1 Gm. chloretone; 2.5 Gm. iodine; 3.1 Gm. beechwood creosote, 4 Gm. each of balsam of Peru, balsam of tolu and myrrh; absolute alcohol, sufficient to make 100.0 Gm. liquid. *Use:* In tuberculosis and distressing coughs.

No. 13. Euterpen: 4.6 Gm. oil of turpentine; 1.5 Gm. oil of eucalyptus; and sufficient of a mixture of 5 Gm. cacao fat, 10 Gm. toluol, and 85 Gm. liquid petrolatum, to make 100 Gm. *Use:* In catarrhal affections.

No. 14. Chloreusar: 0.3 Gm. chloretone; 0.4 Gm. beta-eucaine; 17.8 Gm. extractum antispasmadicum compositum (?Rep.); and 35.0 Gm. compound extract of sarsaparilla (fluid-extract (?) Rep.). *Use:* In asthma, hay-fever, whooping cough and bronchitis.

No. 15. Latschenöl: Oleum pini pumilionis.

—Pharm. Centralh., *45*, No. 50 (Dec. 15, 1904), 976.

Nefrina is the name of an Italian specialty obtained from the suprarenal capsule.

Nerviton is the name of a specialty, described as containing the active constituents of cinchona and colanuts, together with the glycerophosphates of calcium and iron.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), No. 1106.

Neurogen is the name given to a mixture of salts, intended for use in the bath, which is said to have the following composition: sea salt, 798 p.; sodium sulphate, 125 p.; calcium sulphate, 23 p.; iron sulphate, 6 p.

Neurotropin is the name given to the so-called new urotropine, which is the methylene citrate of urotropin, and used with similar effects as those of urotropin in catarrhal affections of the bladder.—Pharm. Ztg., *50*, No. 22 (Mar. 18, 1905), 228.

Novargan is the name given to a water-soluble silver preparation, containing 10 per cent. of silver, and employed like protargol in the treatment of gonorrhœa. Its solutions in water must be prepared without heat, and must be protected from the light. It suffices to distribute the novargan on the surface of the *cold* water, solution being effected spontaneously.—D. Med. Ztg., 1905, No. 8.

Nutrolactis is the trade name given to a fluidextract of *Galega officinalis*, exploited as an efficient agent promoting the secretion of milk, when given in doses of a tablespoonful.

Œttingen Lac is a substitute for adhesive plaster, used in bandaging, composed of 15 Gm. of mastic, 25 Gm. of resin, 8 Gm. of white turpentine, 180 Gm. of alcohol, and 20 Gm. of ether. It is applied, spread upon thin gauze or muslin—Pharm. Ztg., *50*, No. 5 (Jan. 18, 1905), 52.

Olan is the name given to a specialty intended as a substitute for the specialties previously introduced, and known as vasogens and vasoliniments. Like these, olan is a paraffin preparation which is readily emulsifiable with water in various proportions—$\frac{1}{5}$, $\frac{1}{3}$, $\frac{1}{2}$, its weight, such emulsions retaining their homogeneity, and being removable from the skin by washing with water. It is supplied in numerous combinations, with camphor, chloroform, guaiocol, iodine, thymol, formaldehyde, etc.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1004), 820.

Orchipin, an Italian specialty, recommended as an effective antidote for atropine poisoning and as being valuable in nervous debility and neurasthenia, is an oily extraction of fresh animal testicles.—D. Med. Wschr., 1905, No. 8.

Oreson is the name of a Swiss specialty containing guaiacol in pleasant tasting combination.

Ossilite is the name given to an Italian specialty consisting of a mixture of sodium and potassium peroxides in the form of small cubes, each weighing 0.25 Gm. According to the "Giornale di Farmacia," each of these little cubes will produce from 158 to 260 liters of oxygen.

"*Osta*" is the specific title of specialties containing organic salts derived

from bones, designated as "osta-salts." "*Osta-Biscuits*" contain 7½ per cent. of these so-called "osta-salts;" "*Osta-Chocolate*" also contains 7½ per cent., and "*Osta Pastilles*" contain 10 per cent. of these salts. These various preparations are recommended as nutrients.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Ovo-Maltine is the name given to a Swiss specialty, consisting of pure malt extract, fresh eggs, milk and cacao—the starch of the latter being converted into maltose. It is supplied in a dry state.

Oviserum is, according to Turro (Bakteriologisches Centralblatt), a serum of hen's eggs, which is obtained as follows: The shells of the eggs are cleaned as completely as possible before opening the egg, and treated for one hour in a bath of absolute alcohol. After opening one of the ends, each egg is carefully emptied into a basin, and the contents agitated until the whites and yolks make a homogeneous mixture. This mixture is kept for from twenty to thirty days in a vessel maintained at a temperature of 35° C. (95° F.). During this period a semi-solid material separates and falls to the bottom, while the limpid liquid swims on top. This contains a large quantity of dissolved yolk of egg, and is the so-called oviserum. Until recently this serum has been used as a protector for rabbits against anthrax (Milz brand). Whether it may be made available as a therapeutic agent or not, is not yet demonstrated, and its uses are therefore limited.

Paranephrin is the name given to the active constituent of the suprarenal gland, claimed to be obtained under conditions that produce it in a pure and unchanged form, free from even traces of albumoses and peptones. It forms when dried over sulphuric acid a yellowish, friable, but exceedingly hygroscopic mass, which is readily soluble in water and in methyl alcohol, but insoluble in absolute alcohol, ether and benzin. In comparison with the other commercial preparations of the suprarenal gland, paranephrin is distinguished by its far inferior toxity and its non-irritant character. It is supplied in sterilized aqueous solution, 1:1000, containing 0.6 per cent. of sodium chloride, which is quite stable, retaining its physiological activity unimpaired for months.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Pectorin is the name given to an Austrian specialty composed of potassium sulphoguaiacolate in form of pastilles.

Pemzed is the name given to a nutrient specialty intended mainly for feeding infants, and consisting of almost absolutely pure milk-sugar in combination with small amounts of calcium hypophosphite and sodium chloride. It is claimed for this preparation that when added to fresh milk to the amount of 5 per cent., it not only adds to the nutrient qualities of the milk, but increases the keeping qualities of this fluid. Boiled milk so treated remained unaltered for three days.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 578.

Percalmin is a remedy recommended in whooping-cough and other affections of the respiratory passages, in doses of a dessert or tablespoonful, and contains the active constituents of *Thymus vulgaris* and *Eucalyptus globulus*.—Pharm. Ztg., *50*, No. 24 (Mar. 25, 1905), 249.

Perdynamin-Cacao is the name given to a cacao preparation containing pure hæmoglobin.

Perhydrol is the trade-name adopted by a German manufacturing firm for chemically-pure 30 per cent. hydrogen peroxide.

Perlsuchttuberculin is a new substitute for Koch's tuberculin, and obtained in precisely the same manner from cultures of the "perlsucht" bacillus. The filtered bouillon is evaporated to one-half its bulk in the incubator and the original volume restored by the addition of glycerin, or a mixture of glycerin and physiological salt solution. The dose and use is the same as that of tuberculin, beginning with 0.5 to 1.0 milligm. injected into the upper arm.—Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 653.

Perugen is the trade-name given to synthetic balsam of Peru.

Petrovasol is the name given to a substitute for ichthyol-vasogen. It is composed of 10 per cent.

Petrosulfol, evidently an ichthyol substitute, and 90 per cent. of liquid

Vasol (Vasolum liquidum), which is a vasogen substitute.

Petrovasolum Salicylatum, composed of 10 parts petrosulfol, 10 parts salicylic acid, and 80 parts of vasol, is exploited by the same manufacturers under the name of

Rheumasol, and is recommended as a powerful absorbent in exudation, in swellings of the lymphatic glands, in rheumatism and neuralgic affections, in ischias, lumbago, etc., being applied effectively in form of compresses, by inunction, and by penciling.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1106.

Tharyngine is the name of a French specialty containing thymol and eucalyptol, and recommended as a gargle in catarrhal affections, etc.

Thilanthropin is the name of a Parisian specialty, recommended in anæmia, etc., which is stated to have the following composition: Reduced iron, 48 p.; florentine orris root, 13 p.; mellilot, 24 p.; quinine, 2 p.; senna leaves, 8 p.; hypophosphites of calcium and sodium, 5 p.

Philoral-Throat Pastiles are a German specialty, recommended as a reliable analgetic remedy in all painful affections of the throat. They are stated to contain the active constituents of the suprarenal gland, combined with anæsthesin and extract of coffee.—Pharm. Ztg., *49*, No. 87 (Oct. 29, 1904), 926.

Phthisocan is the name given to syrup containing potassium guaiacolsulphonate as essential medicinal component and flavored with tincture of

orange, and intended as a substitute for "Sirolin," which see.—Pharm. Ztg., *50*, No. 33 (April 25, 1905), 352.

Phytin, which has heretofore been indefinitely described as a phosphorus compound contained in many seeds, is now described by J. Loewenheim as being the calcium-magnesium double salt of anhydro-oxymethylene diphosphoric acid. It is described as a white, odorless, nearly tasteless powder, soluble in water, and containing 22.8 per cent., and is supplied and recommended as a powerful tonic, specifically active in impotence and as an incitive to metabolic activities.—Berl. Klin. Wschr., 1904, No. 47.

Picratol is the trade-name given to silver picrate. It contains about 30 per cent. of silver, and being readily decomposed in contact with mucus membranes and the juices of the body, is recommended as a disinfectant remedy in the form of vaginal and urethral suppositories.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Pilocarpinum Compositum is a specialty in tablet-form, each containing 0.0005 Gm. pilocarpine hydrochloride combined with adjuvants and reflex-depressant remedies. The tablets are recommended for the treatment of tuberculous affections of the lungs.—Aerztl. Rundsch., 1905, No. 1.

Piscarol is the name given to a Swiss substitute for ichthyol.—Pharm. Centralh., *45*, No. 35 (Sept. 1, 1904), 669.

Potobonum is the name given to a tea-specialty composed exclusively of bean pods, and is recommended as a reliable remedy in gout, rheumatism and diabetes.—Pharm. Ztg., *49*, No. 87 (October 29, 1904), 926.

Probilin Pills are a specialty introduced by Dr. W. Baumeister for the relief of gall-stone colic. The dose is 3–4 pills taken night and morning with half a liter of warm water, each dose containing 0.1 Gm. of acid sodium oleate and the same quantity of salicylic acid, with some phenolphthalein and menthol.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1904), 1044.

Purgierkonfect is a confection containing 0.12 Gm. of phenolphthalein in each dose.—Pharm. Ztg., *50*, No. 50 (June 14, 1905), 529.

Renol is the name given to a specialty which is said to be a citrate of lithium and vanadium, and is claimed to be useful in affections of the kidney and bladder.

Salen is the name given to a mixture of the methyl- and ethyl-glycolic acid esters of salicylic acid. Both esters form white crystals, the methyl ester melting at 28°–29° C., the ethyl ester at 38°–39° C., while their mixture—salen—is an oily fluid which does not congeal until the temperature is reduced to —5° or —10° C. Salen is readily soluble in alcohol, benzol, ether and in castor oil, but difficultly in olive oil. It is odorless, non-irritant, and recommended for inunctions and embrocations in rheumatic affections.—Pharm. Ztg., *50*, No. 50 (June 24, 1905), 529.

Salvin, the name given to a liquid specialty intended for the treatment of throat troubles, is a name which has also been appropriated for the exploitation of a dermatological "créme," which is said to be obtained by emulsionizing a mass composed of silicium and ceratin in an ethereal vehicle. Applied to the skin it penetrates and forms a silicious covering, which protects the surface from infections during surgical operations and examinations. It is also recommended as a prophylactic against decubitus and as an efficient cosmetic.—Pharm. Ztg.. *49*, No. 65 (Aug. 13, 1904), 684; from D. Med.-Ztg., 1904, No. 63.

Sangan is the new name given to a ferric sulphocyanate-peptonate heretofore exploited under the name of "hæman."—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 760.

Sanasol is the name given to a laxative effervescent powder containing essentially the constituents of the Hungarian bitter waters, with additions to make it more palatable.—Pharm. Ztg., *49*, No. 93 (Nov. 19, 1904), 990.

Sapal is the name given to a solid spirit of soap, which in distinction from other solid spirituous soaps does not melt by the warmth of the hand. It melts quickly, however, on the addition of a little water, thus producing a liquid composed of about 15 per cent. of soda soap, 15 per cent. of water, and 70 per cent. of alcohol. Its peculiar properties render it particularly desirable as a disinfectant for the hands, and also as a vehicle for different medicinal substances to be applied by inunction.—Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 653.

Sapophenol is the name given to a lysol substitute exploited in Belgium.

Sapophthalum is the name given by P. v. d. Widen to a neutral saponaceous base for ophthalmic use, which is obtained by the following formula and process: 60 Gm. of cocoanut oil are mixed with 36.7 Gm. of a 50 per cent. potassium hydroxide solution (sp. gr. 1.539), allowed to stand 24 hours and then heated on the water-bath until a clear solution results. To the warm mass, 70 Gm. of glycerin are now added, the heating is contiued until a homogeneous mixture results. Then 60 Gm. of the fatty acids of cocoanut oil are added, and the heating is continued until the (turbid) solution of 0.5 Gm. of the mixture in 20 Cc. of water, no longer becomes colored on the addition of phenolphthalein. The soap, when cool, is directed to be preserved in well-closed vessels.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1106; from Pharm. Weekbl., 1904, No. 51.

Senval is the name given to a specialty composed of a liquid and a powder, which are to be used together for the treatment of diabetes. The liquid (*a*) is claimed to be a fluidextract, obtained by a special process, and containing the active constituents of senecio, valerian, cinchona and castoreum, and is said to stimulate the pancreatic glands and to prevent the formation of abnormal products by digestion in the stomach and intes-

tines. The powder (*b*) is composed of alkaline salts and sponge charcoal *Carbo spongæ marinæ*), which has a disinfectant action and serves to remove abnormal substances produced by acid fermentation in the liver and blood.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308.

Sepdelen is the name given to an agreeable syrupy specialty containing 0.5 per cent. of iodide of iron.—Pharm. Ztg., *50*, No. 31 (April 19, 1905), 327.

Solutio Chinini Ferro-Chlorati, a popular specialty introduced in Holland by Dr. S. Kersch, may be replaced according to a Netherlands specialty commission by a preparation obtained by the following formula: Dissolve 5.6 Gm. quinine hydrochloride in 21.0 Gm. liquor ferri oxychlorati (4 per cent. Fe), by agitation; add 54.0 Gm. distilled water, then 4.0 Gm. dilute hydrochloric acid, and finally 15.0 Gm. cognac brandy. Mix.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 578; from Pharm. Weekbl., 1904, No. 27.

Somatose in liquid form is now supplied by the manufacturers of this specialty. Two kinds are described, the one sweet and mildly aromatic; the other unsweetened and having the spicy taste of soup-herbs. Both forms are agreeable to the taste and are recommended as promoters of the appetite as well as efficient nerve-tonics and nutrients.—Pharm. Ztg., *49*, No. 91 (Nov. 12, 1904), 969.

Somnoform is the name given to a specialty of the same nature and, it is believed, of the same composition as "Narcoform" (which see).

Sophol is the name given to a substitute for "mesotan" (see Proceedings, 1903, 760), over which, with identical activity, it is claimed to have the advantage of being less irritant in its effects. It is supplied in the form of a powder having a low melting-point, but no information is given concerning its composition.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 761; from Münch. Med. Wschr., 1904, No. 35.

Sorisin is the name given to a 10 per cent. solution of thiocol (sodium guaiacolsulphonate), in syrup of orange peel, and is recommended in pulmonary affections, etc., particularly for children.—Pharm. Ztg., *50*, No. 22 (March 18, 1905), 228.

Spermin "Marpmann" is stated to be a combination of the "liquide testiculaire" of Brown Séquard with the "orchidin" of Bouffé and the "spermin" of Schreiner-Poehl, and is described as being a solution of the substances extracted by diluted alcohol from fresh bull's testicles and containing approximately 2 per cent. of the base $C_5H_{14}N_2$, together with albumoses, which are absent in similar preparations. It is given in doses of 5 to 20 drops with water or other beverages two or three times daily in cachexia and marasmus, and recommended as a tonic and stimulant in debilitated conditions of the heart and nerves, in anaemia, diabetes, and in convalescence from infectious diseases.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Stomosan, a specialty, recommended for the treatment of gallstone ailments, is said to consist of methylamine phosphate.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1106.

Stovaine, a proposed substitute for eucaine and cocaine, which was briefly mentioned in last year's report (see Proceedings, 1904, 631), is now described as being the hydrochloride of dimethylaminobenzyldimethylaethyl carbinol, and is claimed to be devoid of the toxic by-effects that are ascribed to the bases which it is to replace. It forms small, shining lamellæ, melting at 175° C., and readily soluble in water, alcohol and acetic ether, less soluble in acetone; but is supplied in form of sterile solution, 1 : 10, in glass tubes containing 1 Cc.—Apoth. Ztg., *20*, No. 19 (Mar. 8, 1905), 174.

Suprarenin-Cocaine Tablets are recommended as a superior anæsthetic, specially serviceable in odontology. The tablets are readily soluble in water, forming clear solutions, and contain the active constituent of the suprarenal gland in combination with cocaine, boric acid and sodium chloride.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 760.

Syrocolin is the name given to a solution of potassium sulphoguaiacolate.

Tablettæ Antiepilepticæ contain 1 Gm. validol, 24 Gm. compound effervescent salt (?), 30 Gm. potassium bromide, 30 Gm. sodium bromide, and 15 Gm. ammonium bromide, in 100 tablets.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 309.

Tablettæ Extracti Fuci Vesiculosis Compositæ, recommended as an antifat, are chocolate-colored tablets, each containing 0.06 Gm. of extract of bladderwrack, 0.1 Gm. dry, bitterless extract of cascara, 0.1 Gm. extract of frangula. and supplied with sufficient milk sugar, to make the weight to 0.5 Gm. A tablet is to be taken twice or thrice daily.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 309.

Tachysan, recommended as an embrocation, is said to be a product of the distillation of equal qantities of the wood of *Cinnamomum camphora*, and the entire plants of *Artemissa cina* and of *Mentha piperita*.—Pharm. Ztg., *50*, No. 13 (Feb. 15, 1905), 136.

Tallianin is the name given to a specialty which is described as being ozonized terpin. It is supplied in sealed glass tubes, is claimed to develop oxygen, and is intended for intravenous use in veterinary practice in cases of infectious lung inflammations, influenza, congestions of the lungs, angina, tetanus, and all diseases characterized by high febrile conditions.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675; from Tieraerztl. Zentralbl.

Tannochrom is the name given to a combination of chromic oxide, 1 p.; tannin, 1 p., and resorcin, 2 p., supplied both in liquid and in pulverulent form. It is used in gonorrhœa, etc., and as a vulnerary, applied on compresses or dusted over wounds.

Theranol is the trade-name of a 25-per-cent. solution of sodium phenylpropriolate, which is recommended for inhalations in the treatment of pulmonary tuberculosis. The salt, in dry form, is obtainable in the market under its proper name.—Pharm. Ztg., *50*, No. 2 (Jan. 7, 1905), 20.

Therapogen is the name of an antiseptic and deodorant preparation, described as being a water-soluble compound of various terpenes with the naphthalin group. It is an agreeably odorous, oily-saponaceous fluid, which is non-irritant when applied to the skin, and claimed to be an efficient disinfectant as well as powerful deodorant. For the treatment of wounds it is used in form of 3-per-cent. dilutions.—Pharm. Ztg., *49*, No. 59 (July 23, 1904), 618.

Thermiol is the name given to a 25 per cent. solution of sodium phenylpropiolate, which is recommended for inhalation in the treatment of throat and pulmonary affections.—Pharm. Ztg., *49*, No. 90 (Nov. 9, 1904), 961.

Thermogene Cotton, recommended for the treatment of rheumatism, ischias, bronchial catarrh, etc., as a practical substitute for capsicum plasters, is claimed to be prepared by impregnating cotton with an extraction of *Capsicum frutescens*.—Pharm. Ztg., *50*, No. 7 (Jan. 25, 1905), 71.

Thiderol is a specialty, in the form of syrup, containing 2 per cent. of guaiacol, exploited by the same firm and recommended for similar affections as "Codesol" (which see), from which it differs apparently, by not containing codeine.—Pharm. Ztg.. *50*, No. 20 (Mar. 11, 1905), 209.

Thiocolin is the name given to a remedy recommended for bronchitis and pulmonary affections, and described as being composed of guaiacol sulfuric, 6 p.; bismut. loretinic, 1 p.; aqua dist., 60 p.; sirup. compos., 33 p.—Pharm. Ztg., *50* No. 7 (Jan 25, 1905), 71.

Thiolan is the trade-name given to "Unguentum Sulfuratum Mite," a sulphur ointment in which the sulphur is partly dissolved and partly present in a finely divided state. It is claimed to have proven very servicable in various skin diseases.—Pharm. Ztg., *50*, No. 35 (May 2, 1905), 370.

Thiopinol, a liquid specialty exploited for the convenient preparation of the so-called "balsamo-sulphur baths," is supplied in vials containing, it is claimed, 18.875 Gm. volatile oils of coniferous leaves, 14.4 Gm. sulphur, 4.375 Gm. glycerin, and 83.5 Gm. alcohol. The baths have the advantage over ordinary sulphur bath in being pleasantly (? Rep.) odorous, and in cleanliness.—Pharm. Ztg. *50*, No. 33 (April 25, 1905), 351.

Thiopinol ointment, exploited by the same firm, contains 18.0 per cent. of the volatile oils of coniferous leaves, 1.75 per cent. of *thiopinol*, 1 per cent. of glycerin, 0.75 per cent. of *B*-naphthol, and 75.5 per cent. of lanolin and vaselin. Recommended for skin diseases, etc.—*Ibid.*, 352.

Thiovinal, a specialty recommended in diseases of the respiratory organs, bronchitis, phthisis, etc., is stated to be composed of 6.0 guaiacol,

20.0 extr. thymi, 40.0 aqua distill., and 34.0 syrup.—Pharm. Ztg., *50*, No. 18 (Mar. 4, 1905), 190.

Thymomel Scillæ is a preparation of honey, thyme and squill, recommended for whooping cough, bronchitis, and catarrhal affections of the throat.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 309.

Tonogenum Suprenale, mentioned in the Report of last year (see Proceedings, 1904, 633), is now stated to be composed of 0.1 Gm. of thyroid extract, 0.5 Gm. of chloretone and 0.7 Gm. of sodium chloride, dissolved in 100 Gm. of water.—Pharm. Ztg., *50*, No. 5 (Jan. 18, 1905), 52.

Triacol is the name given to a specialty recommended for cough, bronchitis and tuberculosis, and said to be an aromatic solution of potassium and sodium guaiacolate and ethyl-morphine-guaiacol.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675.

Trichophytin is the name given to a filtrate from trichophyton cultures, deprived of all fungoid elements, sterilized, and mixed with 0.25 per cent. of carbolic acid. It is exploited for the treatment of tricophytes, of herpes tonsurans and similar diseases of the hair and scalp.—Monatshf. f. pr. Dermatol., 1904, 679.

Tuklin, designated as being "formalin alcohol ether," is recommended, mixed with volatile oils, for inhalations in the treatment of diseases of the throat and air passages, and in affections of the lungs.—Pharm. Ztg., *49*, No. 104 (Dec. 28, 1904), 1106.

Tuscon-Salve-Plaster is the name given to a soft plaster having an aromatic odor, and composed of 1 part of an extract obtained from 6 parts of chamomile, 2 parts of thyme, 1 part of belladonna and 1 part of eucalyptus, with 9 parts of an ointment base, principally composed of wool-fat. It is claimed to possess efficacy in the treatment of whooping-cough.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 761.

Tussiculin is the name of a specialty recommended for various forms of cough, and represented to be a mixture of the fixed oils of *Melaleuca leucodendron*, *Serpyllum* and *Persica vulgaris* colored with alkanet.

Ungrol is the name given to a specialty recommended as a prophylactic in gonorrhœa and syphilis. It is stated to be composed of glycerogelatin and "sublamin," the latter claimed to have a more penetrant action, coupled with complete absence of irritant effect.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 820.

Unguentum Heyden is the name given to a salve containing 30 per cent. of mercury in form of 45 per cent. of colloidal calomel (calomelol) and 2 per cent. in form of normal mercury. It is used as a substitute for ordinary mercurial ointment in syphilis, the principal advantage being its greater cleanliness.—Medizin. Klin., 1905, No. 1.

Urocital is the name given to a compound of therabromine and sodium

citrate, recommended for the treatment of anginous and cardial asthmatic affections in dropsy, pleurisy, etc., in doses of 0.5 to 10 Gm. several times daily, dissolved in cinnamon water. It is described as a white powder, readily soluble in water, having an agreeable saline-bitter taste, a faint alkaline reaction, and containing 45 per cent. of pure theobromine.—Pharm. Ztg., *49*, No. 99 (Dec. 10, 1904), 1054.

Valofin is the name given to a German specialty recommended as a substitute for fresh infusions of valerian and as a superior nervine and antispasmodic in various ailments, in doses of 10 to 25 drops on sugar, or in hot sugar water. It is said to contain besides the other active constituents of valerian, the valerianic acid partly in form of ethylester, and partly combined with ammonia, together with the constituents of peppermint, and is agreeable to the taste.—Pharm. Ztg., *49*, No. 79, Oct. 1, 1904), 843.

Vasenol is the name given to a new ointment base prepared from vaselin or paraffin oils, under a patented process, by melting them with small quantities a fat-alcohol, such as cetyl-alcohol (from spermaceti), ceryl-alcohol (from Chinese wax), melissyl-alcohol (from wool-fat), carnubyl-alcohol (from carnauba wax), etc., which have the property of rendering the vaselin or paraffin oils miscible with water in large proportion. In distinction from similar preparations, this product is *neutral* and free from fatty acids. As supplied, *Vasenol* is practically an emulsion of yellow vaselin containing 25 per cent. of water, and is described as an exceedingly smooth salve-like body, which is readily miscible with several times its weight of water, and in all proportions with all other fats. *Liquid Vasenol* is a white emulsion, containing 33⅓ per cent. of water, and has the properties of the solid vasenol, except that of consistence. *Vasenol Powder* is described as a dusting powder containing 10 per cent. of vasenol in combination with a powder mixture of any required composition.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 898.

Vasenolformalin, recommended as an efficient foot-powder, is stated to be vasenol powder (see "Vasenol") containing 5–10 per cent. of formalin and 1 per cent. of salicylic acid. Münch. Med. Wschr., 1905, No. 20.

Vasopolentum is the name given to an oleo-paraffin compound intended to replace vasogen, and, like the latter, is supplied both in the solid (salve-like) and in the liquid form, as well as in combination with mercury.—Pharm. Ztg., *49*, No. 99 (Dec. 10, 1904), 1054.

Veratrone is a sterile, alcohol-free preparation, made from the rhizome of *Veratrum viride*, which is used subcutaneously in place of the fluid-extract, and is preserved by the addition of 0.75 per cent. of chloretone. It is clear, agreeably odorous, has a faintly bitter taste, and represents 1 part of the active constituents of the drug in 4 parts.—Therap. Gazette, 1905, No. 1.

Viferral is described as an improved chloral hydrate, obtained from

chloral and pyridine, and claimed to be a safe hypnotic and free from caustic properties. It is a white powder, melting and volatilizing at 153°–155° C., and slowly soluble in cold water, but completely in hot water. It is supplied in tablet form, the dose being 0.75 to 2 Gm.—Ther. Monatsh., 1905, No. 3.

Vitose is an ointment base, described as being a glycerin-oil albuminate, and claimed to be neutral, non-irritant, not liable to become rancid, and micible in all proportions with glycerin and water, as well as oils and fats in general.—Pharm. Ztg., *50*, No. 15 (Febr. 22, 1905), 159.

Vulnoplast is the name given to a new bandaging material introduced by Benario, composed of three distinct but firmly united layers, the lower layer being a salve-mull composed of a gelatin mass, which is medicated with a mixture of 10 per cent. protargol and 5 per cent. of xeroform. The intermediate layer is porous, and composed of cotton-wadding, while the outer layer forms a protective coating sufficiently porous to permit access of air.—Münch. Med. Wschr., 1904, No. 38.

Yeast Soaps, intended for the relief of acne, furuncular formation, dry eczema, etc., have been introduced at the suggestion of Dr. Dreuw. They are prepared by incorporating yeast—in proportions not stated—with neutral, superfatted soap, and are supplied both in the simple form of yeast soap and medicated with various remedial agents, such as salicylic acid (2 per cent.), salicylic acid (2 per cent.) and sulphur (7 per cent.), ichthyol (5 per cent.) and sulphur (7 per cent.), ichthyol (10 per cent.), borax (5 per cent.), benzoin (5 per cent.).—Pharm. Ztg., *49*, No. 54 (July 6, 1904), 568; from. D. Med. Wschr., 1904, No. 27.

Zincperhydrol is the name given to a white powder, insoluble in water, and composed of equal parts of zinc peroxide (ZnO_2) and zinc oxide (ZnO), which readily eliminates hydrogen peroxide in contact with acids. It is recommended as a disinfectant and antiseptic for surgical, gynæcologic and dermatologic purposes, which on account of its non-irritant properties is particularly suitable in dermatologic practice and for the treatment of ulcerated sores, burns, etc.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 309.

CONFECTIONES.

Confectio Sennæ, B. P.—Modification of Formula.—Walter Henry Lenton observes that, however carefully made, confections of senna is almost always slightly gritty, if the B. P. directions are followed, owing to the difficulty of obtainining the coriander fruits in a palpable powder. This detracts from an otherwise pleasant and elegant preparation, for which there is a large demand. The difficulty may be got over by replacing the coriander fruit by an equivalent quantity of oil, as in *Syrupus sennæ*. The last portion of the official monograph might, with advantage, be slightly modified so as to permit the replacement of coriander seed by the oil, using a

little more senna so as to give it the right consistency.—Pharm. Journ. (May 6, 1905), 650.

ELIXIRIA.

Elixir Aurantii sine Saccharo—Formula. — Fred. W. Fleet recommends the following formula for preparing simple elixir without sugar:

Tincture of fresh sweet orange peel	6 fl. ounces.
Alcohol	20 fl. ounces.
Glycerin	25 fl. ounces.
Distilled water, a sufficient quantity.	

Mix the tincture of orange, alcohol and glycerin together; add 49 fl. ounces of water in several portions, shaking after each addition. Pass through filtering paper sprinkled with precipitated phosphate of calcium, returning the filtrate until clear, and finally pass sufficient water through the filter to make 100 fl. ounces of finished elixir.—Pharm. Era (May 25, 1905), 577; from Can. Pharm. Jour.

Elixir Glycerophosphatum Compositum—Formula.—Fred. W. Fleet recommended the following formula for a compound elixir of glycerophosphates at the April (1905) meeting of the Toronto Drug Section:

Calcium glycerophosphate	160 grains.
Sodium glycerophosphate	80 grains.
Potassium glycerophosphate	80 grains.
Magnesium glycerophosphate	80 grains.
Iron glycerophosphate (scale)	40 grains.
Quinine hydrochloride	10 grains.
Strychnine hydrochloride	2 grains.
Citric acid	30 grains.
Gluside (saccharin)	10 grains.
Tincture sweet orange peel	1 fl. ounce.
Alcohol (95 per cent.)	1 fl. ounce.
Glycerin	5 fl. ounces.
Distilled water, a sufficient qnantity.	

Dissolve the glycerophosphates of calcium, sodium, potassium, magnesium, iron, the quinine and strychnine hydrochlorides and citric acid in 10 fluid ounces of boiling distilled water, and when solution is effected add the glycerin. Dissolve the gluside in the tincture of orange and alcohol and add to former solution when cold. Filter through paper sprinkled with talcum and pass sufficient water through the filter to make the finished elixir measure 20 fluid ounces. Dose: One to two fluid drams.—Pharm. Era (May 25, 1905), 578.

Elixirs of Terpin Hydrate—Formulas.—The "Compendium" or Canadian National Formulary gives formulas for elixir of terpin hydrate and codeine and elixir of terpin hydrate and heroine, as follows:

ELIXIR OF TERPIN HYDRATE AND CODEINE.

Terpin hydrate	320	grains.
Codeine phosphate	40	grains.
Gluside (saccharin)	10	grains.
Tincture of fresh sweet-orange peel	1¼	fl. ounces.
Alcohol (95 per cent.)	13	fl. ounces.
Glycerin	20	fl. ounces.
Elixir of orange, sufficient quantity to make	40	fl. ounces.

Dissolve the terpin hydrate, codeine phosphate, and gluside in the alcohol with a gentle heat, add the tincture of orange, glycerin and enough elixir of orange to make 40 fluid ounces.

ELIXIR OF TERPIN HYDRATE AND HEROINE.

Terpin hydrate	320	grains.
Heroine hydrochloride	13⅓	grains.
Gluside (saccharin)	10	grains.
Tincture of vanilla (1 in 10)	1¼	fl. drams.
Brandy	5	fl. drams.
Alcohol (95 per cent.)	15	fl. ounces.
Glycerin	20	fl. ounces.
Distilled water, sufficient quantity to make	40	fl. ounces.

Dissolve the terpin hydrate, heroine hydrochloride, and the gluside in the alcohol with a gentle heat; add the tincture of vanilla, brandy, glycerin and lastly, enough distilled water to make 40 fluid ounces.—Pharm. Era (April 27, 1905), 471.

Elixir of Terpin Hydrate with Wild Cherry—Formula.—Francis Hemm recommends the following formula for preparing an elixir of terpin hydrate containing also wild cherry: Dissolve 256 grains of powdered terpin hydrate in 12 fl. ozs. of deodorized alcohol, add 2 fl. ozs. of glycerin, 2 fl. ozs. of fluid-extract of wild cherry, U. S. P., and 2 fl. drachms of tincture of vanilla, U. S. P. Incorporate two drachms of powdered pumice with this mixture, and filter through a well-wetted filter, refiltering if necessary until brilliantly clear.

Elixir of Terpin Hydrate with Wild Cherry and Heroine is made by dissolving 5 grains of heroine hydrochloride in 2 fluidrachms of distilled water, adding sufficient of the above elixir to make 1 pint, and filtering, if necessary.

Elixir of Terpin Hydrate with Wild Cherry and Codeine, by dissolving 16 grains of codeine phosphate in 4 fluidrachms of distilled water, and making up to 1 pint with the elixir in the same way.—Proc. Missouri Pharm. Assoc., 1904, 81.

Essence of Pepsin—Formula.—The "Compendium" or Canadian National Formulary gives the following formula for essence of pepsin:

Glycerin of pepsin, B. P.	4	fl. ounces.
Sherry	5	fl. ounces.
Glycerin	5	fl. ounces.
Alcohol (95 per cent.)	3½	fl. ounces.
Tincture of fresh sweet orange peel	5	fl. ounces.
Distilled water, sufficient quantity to make	40	fl. ounces.

Mix and filter through paper sprinkled with talcum.—Pharm. Era, April 27, 1905, 471.

Essence of Pepsin—A Tested Formula.—J. T. Davison recommends the following formula, which he has tested and found it in every respect satisfactory, possessing also the merit of being prepared in a few minutes' time :

Pure scale pepsin	2 drachms.
Glycerin	2 fl. ounces.
Dilute hydrochloric acid	2 fl. drachms.
Alcohol	2 fl. ounces.
Syrup	2 fl. ounces.
Spirit of orange (fresh) sufficient.	
Caramel, sufficient.	
Water, enough to make	1 pint.

Reduce the pepsin to powder; mix with the glycerin; add the dilute hydrochloric acid; then the syrup and water sufficient to make 14 fluid ounces. Add the alcohol and a few drops of spirit of orange and enough caramel to color the liquid a light amber or sherry wine color. The possible objections to the preceding article are the deficiency in strength, and the presence of alcohol. A better preparation would be an

Acid Glycerole of Pepsin, prepared by the following formula :

Pure pepsin in scales	2 drachms.
Glycerin	3 fl. drachms.
Dilute hydrochloric acid	36 minims.
Water, enough to make	1 fl. ounce.

Reduce the pepsin to powder and mix with the glycerin and acid in the order named. Add water sufficient to make one fluid ounce. At first, the glycerole is turbid from admixture with bubbles of air. Later it forms a clear, yellowish, viscid liquid. This formula enables the prescriber to increase the quantity of pepsin to the maximum for good, quick effect without unduly increasing the amount of hydrochloric acid. If a more dilute preparation is required, this may be conveniently obtained by admixture with simple elixir at the time of dispensing. In fact, this acid glycerole of pepsin will serve well to make the various popular combinations of pepsin with other medicaments.—Pharm. Era, March 30, 1905, 375; from Rocky Mount. Drugg.

EMPLASTRA.

Plasters—Presence of Bacteria.—Marpmann has found that certain plas-

ters are infected on their surface with all kinds of living bacteria. On applying the surface of the plaster to a sterilized gelatin plate, and subsequently incubating, liquefaction and coloration of the gelatin occurred, even with specially prepared samples. Court plaster, with its gelatin, glycerin, and honey basis, which is kept for some time at 50°–60° C. to harden it, is stated to be specially rich in bacteria, since the plaster basis forms an excellent culture medium, and the temperature favors development; nor is this all, such plaster is often carried about in the purse or pocket, where it is liable to further infection. From sterile water which had been in contact with one square centimeter of such plaster, from 30 to 736 germs were obtained, among which, in addition to the ordinary pus-forming bacteria, were *Proteus*, *Sarcina*, *B. Muriscepticus*, with *Mucors*, *Penicillium*, and *Aspergillus*. Another source of infection, for wounds, is the practice of licking such plaster before applying it.—Pharm. Journ., Oct. 29, 1904, 610; from Jour. d. Pharm. et Chim. (*6*), *20*, 311.

EXTRACTA.

Standardized Powdered Alcoholic Extracts—Research and Experimental Work.—Having some years ago pointed out the superiority of alcoholic extracts over those prepared according to the B. P. from vegetable juices (see Proceedings 1898, 676), E. H. Farr and R. Wright have undertaken an extended series of experiments on several of the principal alkaloidal drugs, with the object of determining the processes most suitable for the preparation and standardization of powdered alcoholic extracts; the first note having been communicated by them, at the Sheffield meeting of the British Pharmaceutical Conference (see Standardized Extract of Hyoscyamus). The research and experimental work include:

(1) An examination of a number of samples of the crude drug, so as to ascertain the average amount of alkaloid or other active principle contained in it.

(2) The determination of the alkaloid in a number of samples of the official extract which it is proposed to displace.

(3) The treatment of several samples of the drug by percolation under varying conditions with alcoholic menstrua of different strengths, and the estimation of the alkaloid and dry extract and the proportion of the former in the latter, in the various percolates.

(4) The consideration of the proper standard for the powdered extract.

(5) The observation of the effect of exposure to air upon the stability of the finished product.

The present paper deals particularly with the alkaloidal content of belladonna leaves and of the green extract of belladonna, with experiments on the drug with alcoholic menstrua of different strengths with the preparation of

Standardized Powdered Extract of Belladonna, and the effect of free exposure to air upon the latter. As a result of these experiments, the authors recommend a process which in its details is essentially identical with that recommended for the standardized extract of hyoscyamus before mentioned. In addition to this, they recommend that the "standard powder" (the diluent) be added to the liquid before evaporation, because they have found by experience that evaporation is thereby greatly facilitated, the formation of lumps is prevented, and the amalgamation of the particles of extract and diluent is rendered much more intimate, and the removal of the product from the dish is easier. The extract may be assayed by Bird's process for belladonna leaves, or by a process which is essentially that of the B. P. Furthermore, the standardized extract, whether of the leaf or root (both being official as solid extract), should not exceed a 1-per cent. alkaloidal strength. Concerning the effect of exposure to air of the standardized powdered extract, the experiments point out the necessity of keeping preparations of this type in well-closed containers.—Pharm. Journ., Mar. 18, 1905, 398–401.

Standardized Powdered Extract of Belladonna Root is the subject of a third paper by the same author, experiments being carried out on the same lines. By the use of 70 per cent. alcohol, there is no difficulty to prepare an extract containing from 1 to 5 per cent. of alkaloid. The authors also record some experiments made to distinguish the root and leaf extracts from each other, by the aid of the microscope.—*Ibid.* (April 15, 1905), 546–548.

Standardized Extract of Hyoscyamus—Process of Preparation.—Basing their recommendation on results obtained by research and experimental work, outlined in a subsequent paper (see "Standardized Powdered Alcoholic Extracts"), E. H. Farr and R. Wright recommend a process for the preparation of a standardized extract of hyoscyamus, which is essentially as follows:

Take a good, carefully-dried sample of the official (B. P.) leaves (with flowering tops), reduce a portion of this to No. 60 powder, determine the alkaloid in it by a reliable process (the authors mention Bird's), and reserve the remainder of this No. 60 powder for the subsequent dilution of the dry extract. This is the "standard powder."

Reduce a larger quantity of the drug from which the sample was taken to No. 20 powder, and exhaust this by repercolation with four times its bulk of 70-per-cent. alcohol. Determine the properties of alkaloid in the finished tincture by the official (B. P.) process for the assay of liquid extract of belladonna, or other reliable assay process. Recover the alcohol from the remainder of the tincture by distillation, and dry the residue in shallow, flat, tared dishes, first over a water-bath and finally in a hot-air oven at a temperature of from 60° to 70° C., until the weight is fairly constant. Take the weight of the dry extract, calculate the percentage of

alkaloid in it, and incorporate with it a sufficient quantity of the standard powder to give by calculation a preparation containing a 0.2 per cent. of alkaloid. Triturate until thoroughly mixed, pass through a No. 20 sieve, and transfer the powdered extract to a well-corked or glass-stoppered bottle. Preserve in a cool, dry place.—Trans. Br. Phar. Conf., 1904, 464–471.

Extract of Licorice—Purification.— In preparing purified extract of licorice from the commercial extract in stick-form, it is the practice of German pharmacists, established by long usage, to interpose layers of straw between layers of licorice broken into short pieces in a percolator, covering the whole with water, and, after a sufficient interval, to withdraw the clear solution, which is then concentrated to the proper consistence by evaporation. G. Geise protests against the use of straw for this purpose, because of the introduction of microscopic organisms from their source into the solution and into the purified extract, as was pointed out by Hager, who proposed disks of wicker in place of straw. But those, also, are objectionable, and he proposes, instead, alternate layers of licorice extract and broken glass, the latter having been previously treated with hydrochloric acid, washed and dried. By percolation, clear solutions are then obtained, which are free from micro-organisms.—Pharm. Ztg., *49*, No. 66 (Aug. 17, 1904), 692.

Extract of Nux Vomica—Formula of the Codex.—E. Bourquelot is the author of the formula for extract of nux vomica proposed for adoption in the French Pharmacopœia, which differs only in non-essentials from the formula of the U. S. P., 1890, except that it is standardized to contain 16 per cent. instead of 15 per cent. of total alkaloid, so as to conform to the strength adopted at the Brussels Conference. The use of coarse powdered drug instead of No. 60 powder, and the direction to continue percolation until a definite volume of menstruum has been used, are the only notable differences.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 863; from Journ. de Pharm. et Chim., 1904, xx, No. 7.

Extractum Stigmatum Maidis—Formula Proposed for the "Codex."—One thousand (1000) parts of corn-silk derived from nearly ripe maize are covered with boiling water, allowed to macerate in a covered vessel for 2 hours, expressed, and the residue of expression treated once more in the same way. The united liquors so obtained are evaporated to 400 parts, allowed to cool, mixed with 300 parts of cold water (? Rep.), and after setting the mixture aside for subsidence, it is filtered, and the filtrate evaporated to the consistence of thick extract, which should form a clear solution with 10 parts of water. The yield is about 8 per cent. of the stigmata employed.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726; from Journ. de Pharm. et Chim., 1904, xx, No. 4.

Yeast Extracts—Preparation.—J. Graff gives some information concern-

ing the preparation of the yeast extracts which have been introduced in recent years under coined names. The preparation known by the name of

Ovos is obtained by washing the yeast, depriving it as much as possible of adhering water by expression, and then boiling it with steam in open vessels. The cell-membranes of the yeast are thus ruptured, their contents enter solution, the insoluble membranes are removed by expression and filtration, and the filtrate is concentrated to the consistence of extract in a vacuum. In the case of the yeast extract known as

Obron, the manipulation is different. The washed and pressed yeast is mixed intimately with at least 5–10 per cent. of its weight of sodium chloride, which causes spontaneous liquefaction and solution of the cell-contents. The liquified yeast-mass is allowed to stand for some time at a low temperature, then diluted with hot water and boiled for from one to two hours. The mixture is subjected to expression, the expressed liquid concentrated at a moderate temperature on a water-bath or by other means, during which any remaining albumen is precipitated, and the concentrated liquid is then allowed to stand in open vessels to clarify by subsidence as much as possible, but is finally subjected to filtration. Prolonged exposure to the air is said to improve the taste of this preparation. The other commercial yeast extracts are prepared in a similar manner.—Pharm. Ztg., *49*, No. 58 (July 20, 1904), 611.

Yeast Extracts—Estimation in Meat Extracts.—Referring to the method prepared by A. Searl for the estimation of yeast extracts in meat extracts (see Proceedings, 1904), M. Wintgen calls attention to a simple method which permits the recognition of from 20 per cent. to 30 per cent. of yeast extracts in such admixture, and is dependent on the observation of Bömer that when the albuminoses are determined in meat extract by salting out with zinc sulphate, the filtrate (using the best quality of filter paper) passes *perfectly clear*, whereas, when yeast extracts, such as "Ovos," "Siris," or "Wuk," are treated in the same way, the filtrate is *uniformly turbid*. The author prepared 10 per cent. solutions of the two extracts mixed in different proportions, acidulated 20 Cc. of the solution with 2 Cc. of diluted sulphuric acid (1 : 4), and salted the mixture out with powdered zinc sulphate. The mixture, after standing 1 or 2 days was then filtered, returning the first few cubic centimeters. Distinct turbid filtrates result in the presence of 20 per cent. "Ovos," or 30 per cent. "Siris," or "Wuk."—Archiv. d. Pharm., *242*, No. 7 (October 11, 1904), 537–538.

FLUIDEXTRACTA.

Aromatic Fluidextract of Cascara Sagrada—Canadian Formula.—The following formula for an aromatic fluidextract of cascara sagrada has been adopted in the "Compendium" or Canadian National Formulary:

Cascara sagrada bark, prime, two years old, in coarse powder	5	pounds.
Licorice root, in coarse powder	10	ounces.
Calcined magnesia, fresh	12½	ounces.
Gluside (saccharin)	40	grains.
Oil of coriander	15	minims.
Oil of anise	20	minims.
Rectified spirit	15	fl. ounces.
Glycerin	10	fl. ounces.
Water	1¾	gallons.

Mix the cascara, licorice and magnesia thoroughly; add the water in portions, mixing well. Place the mass over a water-bath or steam-bath and heat for hours, or until all bitter taste has almost or entirely disappeared. Pack the mass in a percolator and percolate with distilled water until exhausted. Evaporate the percolate over a water-bath or steam-bath to 55 fl. ounces. Dissolve the gluside, oil of coriander and oil of anise in the alcohol; mix with glycerin and mix with the concentrated percolate by shaking thoroughly.

NOTE.—Other aromatic oils may be substituted for the oils of coriander and anise if desired.—Pharm. Era, April 27, 1905, 471.

Fluidextracts of Cinchona—Review of the Different Pharmacopœial and Ex-Official Formulas.—The popularity on the European continent of a Dutch specialty supplied in the form of a fluidextract of cinchona, and claimed by its exploiter to contain, besides alkaloids in abundance, also the cinchona red and tannins naturally existing in the bark, has furnished the text for an interesting review by the editor of the Pharm. Ztg., of the formulas for fluidextract of cinchona, given in the Dutch, Swiss, British and U. S. Pharmacopœia, and the ex-official formulas and researches of Eugene Dieterich, E. de Vrij, Warin, L. Kentmann and E. R. Squibb, with particular consideration of the preparations known as "Extract. Chinae liquid. de Vrij," and "China liquida de Vrij," which are apparently the prototypes of the afore-mentioned Dutch specialty. The editor expresses the opinion that in consequence of the modern views respecting the significance of the "natural grouping" of drug-contents toward their therapeutic value, the galenical preparations will regain the favorable consideration of pharmacologists and physicians, and that a good formula for a fluidextract, constructed on lines, suggested in the formulas and researches reviewed, deserves consideration as an addition to the German Pharmacopœia.—Pharm. Ztg., *49*, Nos. 66 and 72 (Aug. 17 and Sept. 7, 1904), 693 and 757.

Liquid Extract of Cinchona, B. P.—Improved Process.—Elsie S. Hooper points out the defects of the B. P. method of making liquid extract of cinchona. The principal objections that have been raised are: (1) The large quantity of water necessary for the percolation. (2) The incomplete extraction of the alkaloid by the aqueous menstruum. (3) The use of

hydrochloric acid. (4) The inelegance due to the turbidity produced when the extract is mixed with water. Various improved processes have been suggested, among them two by De Vrij and, more recently, one by Wobbe. Revising these, the author, on experimental grounds, gives preference to Wobbe's, which she recommends to be conducted as follows: 200 Gm. of cinchona bark in No. 60 powder are moistened with 50 Cc. of a mixture of 100 parts of glycerin, 100 parts of 90 per cent. alcohol, 30 parts of 25 per cent. hydrochloric acid, and 70 parts of water, and allowed to stand over night. The lumpy mass produced is passed through a coarse sieve and packed in a percolator; 70 per cent. alcohol is then added in portions of 30 Cc. every two hours, until the whole column of the drug is moistened; a reservoir of alcohol (70 per cent.) is then inverted over the top of the percolator, and percolation allowed to proceed slowly. The first 130 Cc. of percolate are received, and the percolation continued until the drug is exhausted. The exhaust percolate (amounting in the experiment to 2500 Cc.! Rep.) is distilled and concentrated, under reduced pressure, to 70 Cc., mixed with the reserved portion, to make 200 Cc. of liquid extract. This, in the experiment, was found to contain all the alkaloids determined by a preliminary assay to be present in the bark.—Pharm. Journ., Aug. 27, 1904, 324–325.

Liquid Extract of Cinchona B. P.—Deficiency in Aroma.—S. Judd Lewis states that when liquid extract of cinchona is made according to the official (B. P.) formula, the preparation frequently possesses very little aroma. By adding some official, or preferably concentrated, tincture of cinchona of good aroma, and allowing for the alcohol and alkaloid it contains, an extract of improved color and aroma is obtained which compares well with that supplied by one well-known manufacturer.—Chem. & Drugg., Nov. 5, 1904, 778.

Fluidextract of Ergot—Preparation by Repercolation.—Controverting the statement that fluidextract of ergot cannot be made satisfactorily without resorting to evaporation of a portion of the percolate, Wiebelitz describes a process of repercolation which differs in some respects from the process usually recommended in this country. Using a menstruum composed of 1 part by weight of alcohol and 4 parts of distilled water, 1 Kgm. of the powdered drug is moistened with the menstruum, packed into a percolator and percolated after 24 hours. The first 750 Gm. of percolate are set aside; the next following 350 Gm. are used to moisten a second quantity of 1 Kgm. of the drug, and the percolation continued to exhaustion in the first portion, using the percolate as received for percolating the second portion. The first 250 Cc. from the second portion are added to the 750 Cc. of reserve from the first kilogram of drug, and this is regarded as finished fluidextract; then 750 Cc. of percolate are reserved from the second portion, followed by 350 Cc. which are used to start a third portion of 1 Kgm. Here, again, the first 250 Cc. are added

to the 750 Cc. of reserve percolate from the second portion, the exhaustion of the second portion being completed as before. The third portion is then finished with the consecutive fractions from the second portion to make 1 kilo fluidextract direct, and the consecutive portions of exhaust percolate are reserved to make fluidextracts—kilo for kilo—directly from fresh portions of drug in the same way. The method of repercolation probably presents no advantage over that practiced here; the weaker alcoholic menstruum may, however, deserve attention.—Pharm. Ztg., *49*, No. 57 (July 16, 1904), 598.

Liquid Extract of Ergot, B. P.—Formation of Crystalline Deposits.—In the course of an examination of a large batch of liquid extract of ergot a considerable deposit of a dirty white appearance was observed by F. H. Alcock at the bottom of the bottle. On removal by filtration, washing and submission to microscopical examination it was found to be crystalline, and recalled the well-known appearance of "triple phosphate" found in sediments of some samples of urine. A chemical examination proved the deposit to consist of magnesium and ammonium phosphate contaminated with a little organic matter. The presence of this suggested a more careful examination in order to find out whether methylamine compounds were present, as these—seeing that they behave like ammonia in some cases—might form similar compounds with magnesium phosphate. No satisfactory evidence of this was obtained, and the organic matter was concluded to be mechanically bound up with the crystals.—Pharm. Journ., May 20, 1905, 748.

Fluidextract of Hydrastis — Amount of Menstruum Necessary for Complete Exhaustion of the Drug.—Experiments made by Choreskis point out that when hydrastis in coarse powder is subjected to percolation with 63 per cent. alcohol it requires ten times its weight of alcohol to completely exhaust the drug. A fluidextract prepared under this limitation had the sp. gr. 1.0, yielded 23 per cent. of dry substance, 0.68 per cent. ash and 2.6 per cent. hydrastis, the latter corresponding well with the analytical results of Keller (2.63–2.97 per cent.) and of Dohme and Engelhard (2.62 per cent.)—Pharm. Ztg., *49* No. 81 (Oct. 8, 1904), 863; from Farmaz. Westnik., 1904, *8*, 324.

Extractum Pareiræ Liquidum, B. P.—Improved Process.—Professor Henry G. Greenish records in detail some interesting experiments, undertaken with the object of inquiring into the value of the methods that have been suggested for improving the official process for its preparation. These experiments have shown: (1) That pressure maceration does not extract the whole of the alkaloid, (2) that the liquid made by that method from the genuine drug deposits on keeping, (3) that boiling materially prevents the subsequent precipitation, (4) that the best menstruum is one composed of alcohol, two volumes, glycerin, two volumes, water, six volumes. The following process is suggested:

Pareira root in No. 10 powder, 100.
Alcohol (90 per cent.).
Glycerin.
Water.
Alcohol (20 per cent.), of each a sufficient quantity.

Mix 20 of alcohol with 20 of glycerin and 60 of water; moisten the root with 40 of this mixture, pack in a percolator, and percolate with the remainder, continuing the percolation with 20 per cent. alcohol until exhausted. Reserve the first 75, concentrate the subsequent percolates to a soft extract, and dissolve in the reserve, adding sufficient 20 per cent. alcohol to make 100. Let stand for fourteen days and filter. (Solids by weight, liquids by measure.) The menstruum found to be most advantageous is, therefore, practically the same as that recommended by Squibb. —Pharm. Journ., Nov. 12, 1904, 698–701.

Liquid Extract of Taraxacum, B. P.—Repercolation Experiment.—Walter Henry Lenton, after discussing the faults and wastefulness of the official (B. P.) process for making liquid extract of taraxacum, communicates some experimental data on the application of the process of repercolation (which he recommends for its preparation). These may serve a useful purpose for reference, and are therefore recorded here. Using a weak alcohol (30 per cent. volume—Sp. gr. 0.665), the following results were shown:

PERCOLATOR NO. 1.

Taraxacum in No. 20 powder, 14 lb., moistened with half a gallon 30 per cent. alcohol.

Volume of Percolate Collected.	Sp. Gr. of Percolate.
1 gallon	1.065
1 gallon	1.000
1 gallon	0.973
1 gallon pressed off	practically colorless and tasteless.

PERCOLATOR NO. 2.

13 lb. of drug moistened with half a gallon of first percolate from No. 1.

Volume of Percolate Collected.	Sp. Gr. of Percolate.
1 gallon	1.090
1 gallon	1.040
1 gallon	0.994
1 gallon	0.980
1 gallon	0.970
10 pints pressed off	weak.

PERCOLATOR NO. 3.

13 lb. of drug moistened with half a gallon of first percolate from No. 2.

Volume of Percolate Collected.	Sp. Gr. of Percolate.
1 gallon	1.130
1 gallon	1.065
1 gallon	1.020
1 gallon	0.988
next half gallon	0.980

Although this was about the color of sherry, it was entirely devoid of taste. The percolators used were cylindrical; and the length of the column of drug was about four times the diameter of the cylinder.

Fluidextract of Valeriana—Preparation Suitable for Making the Infusion Extemporaneously.—An anonymous writer recommends the following formula for preparing a fluidextract of valerian suitable for the extemporaneous preparation of infusion of valerian, and producing the latter of more uniform strength and superior in quality to the infusion prepared with hot water: Mix 100 Gm. of coarsely-powdered valerian root with 5 Gm. ammonia water, 6 Gm. alcohol, and 24 Gm. distilled water, pack the mixture in a percolator, and extract (in the usual way) by percolation with a mixture of 1 part of alcohol and 4 parts of water. The product is a dark-colored fluidextract, having a strong odor of valerian, the sp. gr. 1.175, and contains all the active components of the drug. An infusion prepared in the ordinary way from the drug direct yielded 2.15 per cent. of extract, whereas the infusion prepared from this fluidextract yielded 2.30 per cent.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 577; from Farm. Tidende, 1904, No. 6.

GLYCERITA.

Glycerin Jelly—Typical Formula.—M. I. Wilbert suggests the following formula for preparing a glycerin jelly, which may be varied by substituting agar-agar, gelatin, tragacanth, starch or quince seed for the Irish moss here directed: Boil 15 Gm. of chondrus with sufficient distilled water to make 420 Cc. of strained liquid; while still warm dissolve in this 80 Gm. of glycerite of boroglycerin, and when nearly cold add any desirable perfume or flavor. The boroglycerin may be replaced by glycerin, wholly or in part.—Amer. Journ. Pharm., March, 1905, 130.

Glycerin of Lead Subacetate—Improvement of the B. P. Process.—John Lothian observes that the B. P. process for glycerin of lead subacetate is unsatisfactory. The water which is evaporated in boiling the ingredients together is not directed to be replaced as in the case of the strong solution of lead subacetate. The resulting fluid is therefore so viscid, that it is not possible to filter it without a hot water funnel; besides, in the preparation of small quantities, where the loss by evaporation is proportionately greater, decomposition of the glycerin is apt to take place, with discoloration of the project. This led the author to consider the feasibility of a

cold process, similar to that employed in the preparation of strong solution of lead subacetate, and as the result of his experiments he ultimately adopted the following: Take lead acetate, 25 Gm.; lead oxide (sifted), 17.5 Gm.; glycerin, 126 Gm.; distilled water, 60 Cc. Rub the lead acetate and lead oxide with 5 Cc. of the distilled water into a paste, and allow to stand, with occasional trituration, for twelve hours, add the remainder of the water and the glycerin, and allow to stand, with frequent agitation, for twenty-four hours. Filter. The filtrate has a sp. gr. of approximately 1.33, and is concentrated on a water-bath to the sp. gr. 1.48.—Pharm. Journ., April 22, 1905, 582.

Compound Glycerin of Heroine—Formula.—The following formula for a compound glycerite of heroine is given in the "Compendium" or Canadian National Formulary:

Heroine hydrochloride	10 grains.
Chloroform	20 minims.
Alcohol	40 minims.
Syrup of roses	10 fl. ounces.
Distilled water	2 fl. ounces.
Glycerin, sufficient to make	20 fl. ounces.

Dissolve the heroine in the distilled water and add the syrup of roses gradually, shaking after each addition. Dissolve the chloroform in the alcohol, add to the syrup; then add sufficient glycerin to make 20 fluid ounces.—Pharm. Era, April 27, 1905, 471.

INFUSA.

Infusion and Concentrated Solution of Calumba, B. P.—Total Solids and Characters of Ash.—F. H. Alcock records experiments and results obtained in the determination of total solids, the ash, and the characters of the latter, in the official (B. P.) infusion and concentrated solution of calumba. The infusions were prepared by subjecting the drug to the action of the solvent for different periods of time, but following the B. P. in other respects. Thus a quarter-hour infusion gave 0.25 per cent. of solids, yielding 0.074 (gram) of ash, which required 3.3 Cc. of decinormal sulphuric acid to neutralize it; the figures for a half-hour one were 0.61, 0.15 and 10 Cc., and for a twenty-four hours one 0.712, 0.227 and 13 Cc.; thus showing a noteworthy increase by double-time infusion, especially in the alkalinity of the ash. A commercial sample of liq. calumbæ conc. yielded 4.75 per cent. of solids, and the ash (0.167 gram) required 14 Cc. of decinormal acid to neutralize.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 480–481.

LINIMENTA.

Liniment of Ammonium Iodide—Formula.—The "Compendium" or

Canadian National Formulary gives the following formula for liniment of ammonium iodide:

Strong solution of ammonia	5 fl. ounces.
Tincture of iodine	5 fl. ounces.
Glycerin	5 fl. ounces.
Tincture of camphor	5 fl. ounces.

Mix and agitate.

NOTE.—On standing, the liquid will become colorless, usually with a slight deposit, which may be separated by filtration.

—Pharm. Era, April 27, 1905, 471.

Camphorated Oil—Camphor Content of Commercial Samples.—The question of determinations of the camphor content of the official (B. P.) linimentum camphoræ, is still eliciting considerable discussion among British pharmacists. It is calculated by Sydney C. Gadd that this liniment should contain from 21.30 to 21.48 per cent. of camphor, according to the sp. gr. of the oil used. The following results were obtained in an examination of commercial samples:

	By Weight.		By Weight.
Sample A, Camphor	21.40 per cent.	Sample I, Camphor	19.08 per cent.
" B, "	21.07 "	" J, "	21.26 "
" C, "	20.19 "	" K, "	22.14 "
" D, "	19.80 "	" L, "	21.61 "
" E, "	20.40 "	" M, "	21.52 "
" F, "	21.50 "	" N, "	21.81 "
" G, "	21.85 "	" O, "	20.55 "
" H, "	21.21 "		

—Pharm. Journ., Mar. 4, 1905, 323.

Linimentum Hydrargyri, B. P.—Improved Formula.—Finnemore has pointed out the defective nature of the official (B. P.) liniment of mercury and suggested two formulas, which have now been the subject of investigation by Prof. Henry Greenish, who recommended the following:

Mercury ointment	1 ounce.
Solution of ammonia	400 minims.
Liniment of camphor	800 minims.

Mix the solution of ammonia with the liniment of camphor in a bottle, and with the product triturate the ointment of mercury. This formula contains about one-sixth less ammonia than the official, and then only very slighly, while the official liniment, in the experiments, had separated completely within a week.—Pharm. Journ., Nov. 19, 1904, 737.

Linimentum Potassii Iodidi cum Sapone, B. P.—Improved Formula.—J. H. Shuttleworth, pointing out the esteem in which the liniment of iodide of potash and soap is held by some of the foremost medical authorities for the treatment of rheumatism, and the apparently inconsistent fact that it is among the least used of the official (B. P.) liniments, attributes the latter to the fact that in its present form it takes too long to get absorbed by the system. He has, however, found that a slight modification of the formula, which consists in substituting soft soap, in about one-half the quantity, for the curd soap, renders the liniment rapidly absorbable, and that the omission of the oil of lemon—a useless constituent—renders it more permanent. The following formula is proposed: Sapo mollis, B. P., ℥i; potassii iodidum, ℥iss; glycerinum, ℥i; aqua destillata, ℥x. This yields a faintly opalescent jelly when freshly made, which gradually clears itself on keeping. If a more liquid preparation is desired, the soft soap may be reduced to ℥ss, in the above formula.—Pharm. Journ., Sept. 3, 1904, 376.

Linimentum Potassii Iodidi cum Sapone—Formula for a Liquid Form.—Hy. Williams Jones points out some of the defects of the liniment of potassium iodide with soap of the B. P. and recommends an improved formula in which soft soap is substituted for hard soap, as proposed by A. L. Doran in 1886, while the other ingredients are apportioned so as to produce a more liquid preparation. When made by the modified formula, the liniment resembles ordinary soap liniment in appearance, but is considered fully satisfactory in its properties and action. This modified form the author proposes to distinguish by the title

Linimentum Potassii Iodidi: Take of: soft soap, 2 ozs.; iodide of potassium, 1½ ozs.; glycerin, 1 fl. oz.; oil of lemon, 1 fl. dr.; alcohol (60 per cent.), 10 fl. ozs. Dissolve the soap—preferably by a gentle heat—in the mixture of alcohol, glycerin and oil. Add the iodide of potassium, and shake till dissolved. Decant, or filter, if necessary, after standing a few hours—Trans. Brit. Pharm. Conf., 1904, 509–510.

Liniment of Potassium Iodide with Soap. B. P.—A Satisfactory Preparation if Properly Manipulated.—Peter Boa, referring to the adverse criticism of the official (B. P.) formula for the liniment of potassium iodide with soap, stoutly maintains that the formula itself is not at fault, but that discrepant results are chiefly due to the incomplete direction given for its manipulation. These he recommends to be as follows: Mix the soap, distilled water and glycerin in a porcelain dish; weigh the dish and contents and note the weight; heat on a water-bath, with occasional stirring, till the soap is dissolved; make up with hot distilled water to the weight noted; pour the liquid gradually upon the previously powdered potassium iodide in a mortar, mixing briskly by trituration during the addition of the liquid, continue trituration until a white and creamy product is obtained; set aside in the mortar till cold; then add the oil and mix thoroughly by trituration.—Pharm. Journ., Jan. 21, 1905, 90.

Linimentum Saponis, B. P.—Manipulation.—S. Judd Lewis observes that the B. P. formula for linimentum saponis directs the soap to be dissolved in the water and the product to be mixed with a solution of the oil and camphor in the alcohol. By this method, especially if the water be warm, a quantity of slimy matter is deposited from the liniment, entailing a notable loss on filtering. This is almost entirely avoided by dissolving the soap, oil and camphor in most of the alcohol, and then adding the remaining alcohol previously mixed with the water.—Chem. & Drugg., Nov. 5, 1904, 778.

LIQUORES.

Liquor Alumini Acet.—Preservation with Boric Acid.—The addition of 3 per cent. of boric acid to solution of aluminum acetate is recommended by K. Ludwig to render the solution permanent even when it is largely diluted for surgical purposes.—Münch. Med. Wschr., 1905, No. 14.

Creolins—Method of Examination.—A. Gawalowski considers the following determinations necessary to establish the quality of commercial creolins: specific gravity, reaction with phenolphthalein, water content, phenols, resin, and fat-soaps. The last three are determined as follows: Into a tube, graduated in $\frac{1}{5}$ or $\frac{1}{10}$ Cc. and of capacity to make readings up to 30 Cc., he places 10 Cc. of the creolin, add 10 Cc. of solution of calcium chloride (25 Gm. anhydrous salt to 100 Cc. distilled water) and, after shaking, 10 Cc. of benzin. After again shaking vigorously, the tube is allowed to stand at rest, well-corked, for half to one day, and examined. The increase in the lower (aqueous) layer, which is colorless, gives the amount of water in the sample; the increase in the upper (benzin) layer, which is deep brown, gives the amount of phenols, expressed in cubic centimeters. The intermediate layer, which is a clay-yellow magma, contains the soaps, the amount of which is calculated from the diminished volume. To determine the character of the phenols, a small portion of the benzin-layer is evaporated on the water-bath to remove the benzin, and exposed to the action of nascent hydrogen. After 12 to 24 hours a sheet of paper moistened with basic lead acetate is placed over the container. If the paper becomes browned, the phenols are shown to be sulphonated.—Pharm. Ztg., *49*, No. 81 (October 8, 1904), 864; from Zschr. Oester. Ap.-Ver., 1904, No. 39.

Ferric Solutions—Color Reactions, Glycerin, etc.—Thomas Dunlop has observed that if one drop of Tr. Ferri Perchlor. (or a similar preparation of any of the official (B. P.) ferric solutions) be diluted with half an ounce of water, and half an ounce of glycerin be added, an intense yellow color is immediately developed. The fact that diluted dialysed iron, when *acidified with diluted HCl* and mixed with glycerin (glycerin precipitates diluted dialysed iron *per se*), does not give the same reaction suggested

that the method of peroxidation had, perhaps, something to do with the production of the color, and that seems to be the case, as different results were obtained when other oxidizing agents were used. Extending the experiment to rectified spirit and syrup (B. P.), the author obtained the color reactions indicated in the following table:

Half an Ounce of Water Containing:	Color Produced on Adding Half an Ounce of:		
	Glycerin (Price's No. 1).	S. V. R.	Or Syrup (B. P.).
(1) One drop liq. ferri perchlor.	Orange-yellow.	Pale yellow, turning russet-brown.	Lemon-yellow.
(2) Two drops liq. ferri pernit.	Intense orange-yellow.	Very pale yellow, turning deeper russet-brown.	Very pale yellow.
(3) One drop liq. ferri persulph. (1 to 3).	Lemon-yellow.	Opalescent, precipitated (Basic sulphate?).	Very pale yellow.
(4) One-eighth grain iron wire liq., peroxidized with Cl.	Lemon-yellow.	Tinged yellow.	Tinged yellow.
(5) One-half grain ferrous sulph. liq., peroxidized with H_2O_2.	Very faint yellow tinge perceptible.	Colorless.	Colorless.
(6) One drop liq. ferri dialysat. (1 to 3) with one drop HCl dil.	Brownish-yellow.	Not tested.	Not tested.

It will be noted that the intensity of the color produced is graded, liquor ferri persulph. yielding the palest, liq. ferri perchlor. an intermediate, and liq. ferri pernit. developing the color with the greatest intensity. These reactions are doubtless due to some as yet unknown compound, and deserve further investigation.—Pharm. Journ., Mar. 4, 1905, 323.

Liquor Ferri Albuminati—Improved Process of Preparation.—E. Carlson suggests several improvements in the preparation of solution of ferric albuminate. He regards it to be important that the albumin solution be filtered clear, not simply strained; also that it is a mistake to add the albumin solution to the iron solution in a thin stream; the whole of it should be added at once. The manipulation should be as follows: 30–40 Gm. of dry egg albumen are dissolved in 1500 Gm. of cold water, any impurities allowed to subside, and the solution filtered. Then 10 Cc. of normal soda solution are mixed with the clear albumen solution, and this liquid is added in one portion to a mixture of 120 Gm. of solution of ferric chloride and 1500 Gm. of water, and stirred. The precipitate is then washed with water, by subsidence, until the washings no longer give a reaction, or at most pale opalescence, with silver nitrate, and is then collected on a

cloth and drained. This should not require more than 24 hours, and the weight of the precipitate should be reduced to about 730 Gm. If then to the precipitate, transferred to a porcelain dish, 10 Cc. of normal sodium hydrate solution are added, it will instantly dissolve, and, if heated on the water-bath, will appear perfectly clear when viewed by transmitted light, while by reflected light it appears as a barely turbid and black-brown fluid. Allowed to cool, 150 Gm. of alcohol, 100 Gm. cinnamon water, 2 Gm. aromatic tincture, and sufficient water are added to make 1000 Gm. So obtained, solution of ferric albuminate responds to the official (G. P.) requirements, and possesses unlimited stability.—Pharm. Centralh., *46*, No. 3 (Jan. 19, 1905), 43.

Solutio Gelatinae Salita—Formula Proposed for the "Codex."—Gelatina alb., 10.0 Gm.; sodii chlor. pur., 7.0 Gm.; aqua distill., q. s. The gelatin (which should be the best commercial sort) and salt are dissolved in 500 Cc. of the water on the water-bath, and if the solution is not neutral, it is carefully neutralized with $\frac{N}{10}$ soda solution. Sufficient water is then added to make 1000 Cc. of solution which is heated for 10 minutes in the autoclave to 110° C., filtered while hot, transferred to sterilized vials of 150 Cc. capacity, and heating these again for 15 minutes at 110° C.

Solution of Glycerophosphates—Formula.—The following formula for a solution of glycerophosphates is given in L'Union Pharm., and recommended as being useful in cases of nervous depression:

Calcium glycerophosphate	6	grams.
Sodium glycerophosphate	4	grams.
Potassium glycerophosphate	3	grams.
Iron glycerophosphate	3	grams.
Magnesium glycerophosphate	2	grams.
Strychnine sulphate	0.03	centg.
Sparteine sulphate	0.60	centg.
Citric acid	3	grams.
Distilled water	100	grams.
Glycerin, enough to make	150	Cc.

—Pharm. Era, Dec. 8, 1904, 579.

Solution of Lead Subacetate—Gravimetric Method of Estimation.—George F. Merson prefers the following gravimetric method to the official (B. P.) volumetric process of estimation of solution of lead subacetate: To 50 Cc. of distilled water add 5 Cc. of dilute sulphuric acid and heat in a small flask to about 90° C., and add 1 Cc. of the lead subacetate solution from a pipette. Counterpoise two small filters (as in opium assay) and moisten them with warm water. Carefully decant the contents of the flask portion by portion upon the filters, well rinsing the flask with water. Wash the precipitate with warm water till free from acid, dry in a water-oven and weigh. It is to be noted that a measured quantity was used

simply for convenience in the experimental stages—for comparison with the official requirements 1 Gm. or other convenient weight must be taken. The method is practically accurate, as proven by experiment. There is practically no loss of the lead sulphate, even after prolonged washing.—Pharm. Jour., Jan. 21, 1905, 70.

Lime Water—Quantitative Determination of Lime.—Utz recommends the following method for the quantitative determination of lime in lime water, which is based on the observation noted in Schmidt's Lehrbuch der pharm. Chemie and since confirmed experimentally by the author, that lime is quantitatively precipitated from its acetic acid solution by ammonium oxalate as from its ammoniacal solution, and usually with greater rapidity. The ammoniacal solution, freed from ferric oxide and alumina in the usual manner, is acidulated with acetic acid, the solution heated to boiling, and an excess of ammonium oxalate added. The calcium oxalate is dissolved in hydrochloric acid, the lime is precipitated in the sulphuric acid, and weighed as sulphate.—Pharm. Ztg., 49, No. 97 (Dec. 3, 1904), 1030; from Œsterr. Chem.-Ztg., 1904, No. 22.

Solution of Magnesium Citrate—Method of Preparation.—Years of exasperation with the fungus growth in solution of magnesium citrate, have led John Stuchlik to experiment, until he found the following method of manufacture eminently satisfactory. The formula and the method are as follows:

Acid citric	oz. 24
Magnesia carb.	oz. 12
Syr. citric acid	oz. 48
Water to make	bottles 24

Mix and make solution.

The Pot. Bicarb. is not added until there is a call for the solution. The point emphasized by the author is that the syrup must be freshly prepared and boiled for about 3 minutes before adding to the solution; also that the solution must be sterilized in the bottles for at least one-half hour.—West. Drugg., Febr., 1905, 97.

Concentrated Solution of Quinine.—Preparation by the aid of boric acid and glycerin. See *Quinine*, under "Organic Chemistry."

Maceratio Renalina Porci—Preparation.—Page and Dardelin recommend a macerate of hog kidneys for the treatment of nephritis, which must be prepared as required according to the following directions: A perfectly fresh kidney is cut into thin slices, washed in cold water to remove adhering urine, then chopped fine, and reduced to pulp in a mortar. The magma so obtained is mixed with 300 Gm. of water, to which sodium chloride is added in physiological proportions (7.5 : 1000), and allowed to stand with occasional shaking for 3 hours—this maceration being then

preserved in a very cool place (a refrigerator) until consumed. The red supernatant broth, accumulating over the dregs, is to be taken during the day in three doses.—Münch. Med. Wschr., 1905, No. 6.

MELLITA.

Mel. Depuratum.—Improved Process.—K. Alpers observes that the method of purifying honey is largely dependent on the nature of the crude honey, and that, therefore, the process of the G. P. does not uniformly give satisfactory results. He has, however, used the following modification with general satisfaction; the honey, diluted with 1½ parts of water as required by the G. P., is mixed with the white of one or two eggs per kilogram, previously beaten and dissolved in water, and the mixture boiled in the usual way, in a clean bright copper kettle. The coagulated albumen encloses the impurities and permits the rapid filtration through a plaited filter while the mixture is hot—this being further accelerated by adding a little well-pulped filter-paper. The bright filtrate is then evaporated to the proper consistence in a pewter or porcelain dish on the water-bath. Another writer, "Ha.," protests against the use of white of egg as a clarifying agent, on the ground that the honey purified with it soon acquires more or less turbidity. He prefers white bole for this purpose, as follows: 10 Kgm. of crude honey are dissolved in 15 Kgm. of distilled water, mixed with 30 Gm. of bolus alba, and boiled on a steam-bath in the usual way, skimming it 3 or 4 times; it is then transferred into a jar, filtered *after* cooling, and evaporated on a steam-bath, with constant stirring, to the proper consistence (sp. gr. 1.34–1.35). The use of white bole has the disadvantage, however, that traces of iron may be introduced into the honey.—Pharm. Ztg., *50*, No. 81 (Jan. 28, 1905), 81.

Mel. Depuratum, G. Ph.—Official Requirements.—P. Arauner recommends that the specific gravity of the purified honey of the Germ. Phar. should be increased to 1.340–1.350, so as to render it more stable. It should under no condition be below 1.335. The ammonia test should be so construed that the mixture shall not change color "within a short time," since all purified honey will darken with ammonia after some time. The prescribed quantity of alcohol for the solubility test should not be added at once, but gradually, in small portions, shaking vigorously after each addition, because of the possible precipitation of sugar when it is added too suddenly in large quantity, and the consequent erroneous interpretation of the turbidity.—Pharm. Ztg., *50*, No. 33 (April 25, 1905), 350.

MISTURÆ.

"Milk of Camphor"—An Efficient Toilet Preparation.—A cream-like emulsion of fatty oil which possesses interesting possibilities as a toilet article, is suggested by M. I. Wilbert. It may be prepared as follows: Spirit of ammonia, 5 Gm.; oleic acid, 10 Gm.; cotton-seed oil, 20 Gm.;

camphor, 1 Gm.; water, enough to make 150 Gm. The oil, oleic acid and spirit (*not aqua!* Rep.) ammonia, are poured successively into a dry bottle, thoroughly mixed, and the camphor dissolved in the mixture. Water is then added in quantities of 5 to 10 Cc. at a time, shaking after each addition, until a uniformly smooth mixture, weighing 150 Gm., is formed. Mineral oil or expressed oil of almond may be used in place of cotton oil, and, if preferred, a perfume more desirable than camphor may be added—the formula being a typical one in which the base is practically the same as "petrox" (see Proceedings, 1901, 648) previously suggested by the author.—Amer. Journ. Pharm., March, 1905, 130.

Tonic Mixture—A Suggestion.—Wm. Mittelbach suggests the following formula for a good tonic prescription: Potassium citrate, ½ oz.; tincture of ferric chloride, 1 oz.; syrup of citric acid, 4 ozs.; distilled water, sufficient to make 8 ozs. This prescription is compatible with sulphate of strychnine, arsenous acid, detannated tincture of cinchona, detannated elixir of gentian, and some other things usually prescribed. The distilled water may be wholly or in part replaced by the gentian and cinchona elixirs.—Proc. Missouri Pharm. Assoc., 1904, 77.

Cosmetic Emulsion—Preparation with Albumen.—Hugo Kühl recommends the following formula and process for preparing a stable and efficient cosmetic emulsion with dry egg-albumen as emulsifying agent: Triturate 5 Gm. of dry egg-albumen to very fine powder in a deep, capacious mortar; then add 15 Gm. of expressed oil of almond, and emulsify with 10 Gm. of distilled water by vigorous trituration, adding, when emulsification is complete, 15 Gm. more of water, followed by the gradual addition, with constant stirring, of 20 Gm. of cologne water. This causes a flocculent separation of the albumen, the mass assuming a pasty condition. After triturating the mass, and gradually adding 20 Gm. of glycerin, a thick liquid, permanent, snow-white emulsion is produced, which possesses admirable cosmetic qualities.—Pharm. Ztg., *50*, No. 43 (May 31, 1905), 454.

MUCILAGINES.

Mucilage of Acacia—A Suggestion.—W. A. Hall suggests the following method of preparing mucilage of acacia, in which the important points are the exclusion of the air and the use of distilled water, instead of ordinary tap water usually taken: Take any wide-mouth bottle of convenient size and fill it within ¼ inch of the lip with gum acacia and distilled water in the proportion of one ounce of gum to two ounces of distilled water, adding also ½ grain of benzoic acid to each fluid ounce of the mixture. Fit a good cork accurately, so there will be practically no space left. Reverse ends with the bottle about every half hour, and in a short time your mucilage, practically U. S. P., is made with very little trouble, and will keep.

Finally strain.—Pharm. Era, Dec. 15, 1904, 605; from Proc. Mich. Pharm. Assoc., 1904.

Mucilage of Acacia—Sterilization an Advantage.—G. Pinchbeck observes that although gum acacia is usually regarded as an inert substance, probably owing to its general use in pharmacy as an excipient or emulsifying agent, the researches of E. Bourquelot have demonstrated that this is far from being so, owing to the active oxydase which the gum contains; this renders it both therapeutically and chemically incompatible with many important drugs, the physiological action of which it may considerably modify. The class of enzymes or ferments known as oxydases are most active at a temperature of 40° C., and it is obviously necessary to exceed this optimum in order to ensure their complete destruction. Planche and Bourquelot have observed that the oxidizing power of the mucilage prepared from the gum may be eliminated by heating for some time to 100° C., and the object of the authors' note is to show what effects, physical or chemical, the destruction of the ferment has on the mucilage. Having carefully prepared some mucilage in the official (B. P.) proportion of gum and water, from small tear Turkey gum, the author eliminated the active oxydase by heating it in an Erlenmeyer flask, plugged with cotton, in the steam sterilizer for one hour at 100° C. The physical effects of the heating consisted in a marked decrease of the rate of viscosity and the production of a slightly turbid mucilaginous liquid. This increase of fluidity is an advantage, as its volume may be more readily measured. A series of experiments were made to determine whether the mucilage, deprived of its oxydase, had depreciated to a considerable extent as an emulsifying agent. Comparison experiments were made with ordinary mucilage in every case. The results, which are given *in extenso*, demonstrate (1) that the elimination of the oxydase (which ensures the retention of the full physiological activity of the drug emulsified) does not impair the emulsifying power, and (2) that the heating has a marked improvement on its preservation.—Pharm. Journ., April 29, 1905, 620.

OLEA.

"Eserine Oil"—Preparation.—Emil Wild describes the following method for preparing a solution of physostigmine salicylate in olive oil, which he has named "eserine oil." It is intended for convenient use in eye practice, presenting the advantages of stability and painlessness over the aqueous solutions commonly employed. 0.2 Gm. of physostigmine salicylate is triturated in a porcelain mortar, in which it is dried completely at 100° C. It is then transferred to a carefully-dried glass flask containing 40 Gm. of the finest Nice olive oil, mixed with this by vigorous shaking, and heated in a drying oven gradually to 150°-158°, until a clear solution results, carefully avoiding a higher temperature on account of the ease with which the alkaloid salt is decomposed above 160° C. On cooling

to about 30° the solution becomes opalescent. It is then cooled to about 10° with frequent shaking, during which a small portion of the alkaloid is deposited in minute crystals, but without materially diminishing the activity of the product. The turbid solution, containing ½ per cent. of salicylate must be shaken before use. It should be dispensed in brown glass vials stoppered with a pipette-stopper.—Pharm. Ztg., *50*, No. 20 (Mar. 11, 1905), 208.

Paraffinum Liquidum Compositum—Formula.—Fred. W. Fleet communicated the following formula for a compound paraffin oil (presumably for nebulization?–Rep.), at the April (1905) meeting of the Toronto Drug Section:

Oil of pinus sylvestris	100 minims.
Oil of wintergreen	40 minims.
Oil of eucalyptus	40 minims.
Thymol	40 grains.
Menthol	40 grains.
Liquid paraffin, to make	20 fl. ounces.

Mix. Each fluid ounce contains 5 minims oil of pinus sylvestris, 2 minims each of the oils of wintergreen and eucalyptus, 1 grain menthol and ½ grain thymol.—Pharm. Era, May 25, 1905, 578; from Can. Pharm. Journ.

PILLULAE.

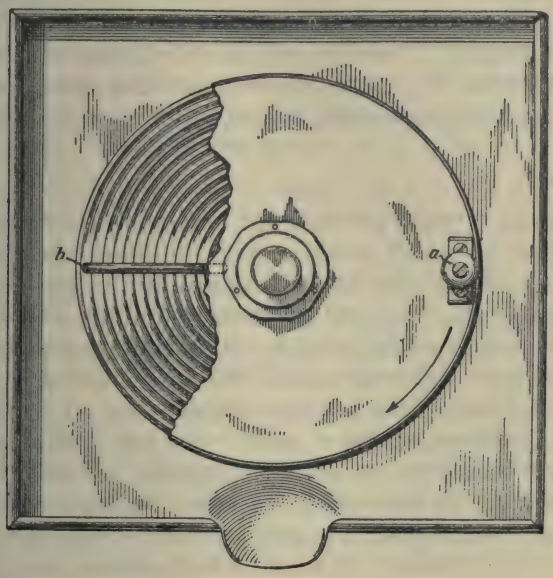
Pill Machine—New Form.—Jacob Swidker has devised the pill machine shown by Figs. 39, 40, 41, in essential details which presents many advantages over the ordinary form. It consists of a wooden frame or tray with raised edges and a lip for the convenient removal of the finished pills, which are formed by the machine, consisting of a metal disc provided with concentric grooves and a revolving lid, correspondingly grooved. The pill-mass having been rolled into a pipe of the required diameter and length is placed on the disc as shown at *b* (Fig. 39), and by turning the adjusted lid, by means of the handle or knob *a* (Figs. 40 and 41) is divided and rolled into pills, as shown at *c* (Fig. 42). The pills are perfectly spherical, and do not require subsequent rounding, as is usually necessary when they are made on the older form of pill machines.—Pharm. Ztg., *50*, No. 19 (Mar. 8, 1905), 198.

Pills—Method of Coating with Salol, Tolu, etc.—H. A. B. Dunning gives some practical directions for coating pills which deserve the attention of careful dispensers. The most convenient and generally useful

Enteric Coating is that produced with salol. If this is carefully applied, the pills are sure to pass through the stomach unchanged and to dissolve in the intestines. The process is carried out as follows: Enough salol (approximately 1 grain to every 3-grain pill) is placed in a 4-ounce evapo-

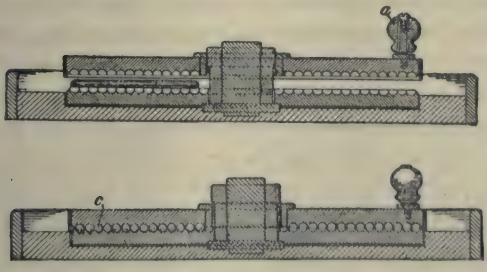
rating dish so that, when fused, it will not cover the pills to be dropped in the dish. Into the liquefied salol, melted on a water-bath and allowed to

FIG. 39.



cool, so that by passing the hand along the bottom of the dish there is scarcely any warmth felt, drop the pills, and rotate the dish, while holding in hand, by encircling rim with thumb and forefinger, and supporting with other fingers. Rotate dish until pills are coated and salol cooled.

FIGS. 41, 42.



Repeat this operation twice, each time reducing the salol about one-half. Finally apply a finishing coat by using only sufficient salol when melted to coat the dish, which must now, however, be kept quite warm, the pills dropped in and rotated quite rapidly until shiny, when they are turned into a cool dish and kept moving until cooled. The

Tolu Coating of pills is best accomplished with a solution of 5 Gm. of tolu in 20 Cc. of alcohol, straining the solution and adding 5 Cc. of ether. The pills are dropped into the lid of a 1-pound ointment jar which has been thinly coated with this solution and rotated until thoroughly coated, then turned into another lid of the same size and rotated in this to remove the excess of solution. While the pills are still shining, but not too moist, they are transferred to a third lid (or evaporating dish) faintly coated (with the tips of the fingers) with oil, and rotated until the coating is perfectly dry. A second or third coating may be applied in the same manner if necessary.

Silver Coating is readily accomplished with the aid of an excipient composed of equal volumes of alcohol, syrup, mucilage of acacia, and water. If freshly made, the pills had better be given a preliminary coating of tolu, as described. If dry, this is not necessary. The pills are placed in the lid of a 1-pound ointment jar, which has been thinly coated with the above-described excipient, and rotated until they have acquired a uniform thin coat of the excipient. They are then dropped into a 1-pound ointment jar in which a sufficient number of silver leaves have been placed and the jar is rapidly rotated until the pills are thoroughly coated. This coating may be brightened by transferring the pills into another jar containing some silver foil and shaking the pills for some time, whereby they will acquire the requisite polish.—Proc. Md. Pharm. Assoc., 1904, 119–121.

Keratin-Coated Pills—Improved Process.—H. A. B. Dunning recommends the following process and manipulation for producing a beautiful and thoroughly-coated enteric pill, which is claimed to be an improvement on any of the methods described in text-books: One Gm. of peptonized keratin is rubbed to a smooth paste (in a small beaker) with 6 Cc. of spirit of ammonia. The mixture is then heated, and kept hot while a few drops of water are added (just sufficient to cause a clear solution). The pills, having been made hard and placed on the points of fine needles, are, one at a time, immersed in the solution, which is kept hot, the loss by evaporation being made up by the addition of spirit of ammonia and a little water. After being immersed in the solution, the pill is held pointing downward for a few moments and the drop forming on the under surface is removed by a piece of card-board or the inner side of the beaker. The needle is then rotated for a few moments until the coating has set, when the blunt end is pushed through a piece or card-board standing vertically. After the pills have all been coated in this manner they are dried in a current of warm air.—Drugg. Circ., Febr., 1905, 45.

Ovulae—Formulas Proposed for the "Codex." — Gelatina alb., 10.0; aqua distill., 30.0; glycerinum, 60.0. The gelatin which should be the best commercial sort ("Gélatine lavée et séchée") is immersed in the water until the latter is completely absorbed and then added to the previously

warmed glycerin. When solution is effected, it is strained and poured into moulds which should be coated with a trace of vaselin-oil.

Ovulæ Acidi Tannici are made by immersing 10 Gm. of white gelatin in a solution of 3 Gm. of tannic acid in 15 Gm. of distilled water, and when the latter is completely absorbed, adding it to 60 Gm. of previously warmed glycerin, treating the mixture as above. The liquid is then congested in 6 moulds, each "ovula" to contain 0.5 Gm. tannin.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726; from Jour. de Pharm. et Chim., 1904, XX, No. 4.

Pilula Ferri B. P.—Improved Formula.—Prof. Henry G. Greenish has made a series of experiments to determine the value of the improvement suggested in the formula for pilula ferri B. P. offered by Lucas (see Proceedings, 1904, 554). This consists in mixing 150 grains, each, of glucose and finely-powdered dried ferrous sulphate, and 30 minims of distilled water, and quickly adding 95 grains of finely-powdered dried sodium carbonate, setting the mixture aside for ten minutes, to complete the reaction, then adding 15 grains of powdered tragacanth and 50 grains of powdered acacia, and mixing well. While in the official pill mass, there is a progressive diminution of ferrous carbonate, in the improved form there is no diminution observable after seven weeks; indeed, on account of loss of weight by drying, there is an apparent increase shown in the recorded experiment.—Pharm. Journ., Nov. 19, 1904, 737.

Compound Galbanum Pill, B. P.—Improved Process of Making.—Reviewing the defects in the B. P. process for making compound galbanum pills, David A. Young suggests that this process is greatly improved by substituting kaolin for the glucose directed in the official formula. The myrrh is powdered, the kaolin mixed with the galbanum and asafetida, and the whole beaten into a mass, which, though it requires some work to produce, is a very nice one, and is easily rolled into pills, which will retain their shape.—Pharm. Journ., Dec. 10, 1904, 852.

PULVERES.

Compound Licorice Powder—Systematic Course of Examination.—John Evans discusses the question of examinations of compound licorice powder, which is now manufactured on a large scale and found on the market in variable qualities. He suggests a systematic course for its examination, based upon the recorded analyses of the drugs of good quality that enter into its composition, the determination to be made being exemplified in the following table giving the result of analyses of five samples of the powder:

	Moisture.	Total Ash.	Insoluble Ash.	Soluble Ash.	Alcohol Extract.	Sugar.	Alcohol Extract. Less Sugar.	Sulphur.
1.....	13.86	5.12	2.26	2.86	60.52	50.0	10.52	8.92
2.....	4.20	6.54	3.98	2.56	60.16	47.7	12.46	8.49
3.....	3.98	4.84	2.36	2.48	60.08	49.2	10.88	8.91
4.....	3.68	4.88	2.00	2.88	63.44	50.0	13.44	8.90
5.....	3.84	4.66	1.68	2.98	63.10	49.6	13.50	8.78

Samples 4 and 5 were prepared by the author. For the details of the method the original paper must be consulted, in Pharm. Journ., Mar. 11, 1905, 363–364.

Benzoinated Dusting Powder—Formula.—The following formula for a benzoinated dusting powder— pulvis inspersorius benzoatus—is recommended in "Jour. der Pharm. von Elsas-Lothringen:" Zincum oxydatum, 30; amylum tritici, 30; talcum, 30; acid. boric. pulv., 3; lanolin c. aq., 3; vaselin flav., 3; acid. tannic, 3; lycopodium, 18; tinct. benzoes, 10. The first three powders are mixed, and to one half of the mixture the tincture is added and dried. The fats are incorporated with the second half by trituration, the first half and the other ingredients are added, and the whole is then well mixed and run through a fine sieve.—D.-A. Apoth. Ztg., March, 1905, 2.

SAPONES.

Soap—Determination of Glycerin.—E. Martin recommends the following method for determining the glycerin in soaps: Ten Gm. of the sample is dissolved in 50 Cc. of hot water. The fatty acids are liberated by the addition of a slight excess of sulphuric acid, the heat being continued until the fat is completely melted. The solution is then filtered through a wetted filter, and the fatty acids left on the filter are washed with boiling water. The filtrate is treated with excess of basic lead acetate solution, and, after standing for half an hour, the liquid is filtered into a graduated 250 Cc. flask. The precipitate is washed, excess of lead removed by the addition of sulphuric and the whole made up to 250 Cc. After subsidence 25 Cc. of the liquid is filtered or pipetted off, introduced into a conical flask with 25 Cc. of potassium dichromate solution (84.565 Gm. $K_2Cr_2O_7$ per liter), 20 Cc. of sulphuric acid (50 per cent.), and heated on the water-bath for half an hour. After cooling, the excess of dichromate is titrated back by means of ammonium ferrous sulphate 160 Gm.

$FeSO_4Am_2SO_46H_2O$ and 20 Gm. H_2SO_4 per liter) in the usual manner by spotting out on a white tile, and using potassium ferricyanide as an indicator. These solutions should first be "set" against each other. When V= the number of cubic centimeters of the solution of ferrous ammonium sulphate equivalent to 25 Cc. of dichromate solution, and v= the number of Cc. of this solution actually used to titrate back the unused dichromate, then $\frac{V-v}{V} \times 25 =$ the percentage of glycerin in the soap. If the combined glycerin also be required, as in the case of superfatted soap, another determination after saponification must be performed. The difference of the total and free glycerin will be the amount of the combined glycerin.—Pharm. Journ., Dec. 31, 1904, 958; from Moniteur Scient. (4), 17, 797.

Soap—Detection of Sodium Silicate.—Ahmed Hussein observes that in analytical text-books it is generally directed that sodium silicate be dissolved out of the dry residue left insoluble in alcohol, by means of water. It is found in practice, however, that the process of drying renders the greater part of the silica insoluble in aqueous solution. The author, therefore, recommends the following method: A weighed quantity of rasped soap is dissolved in alcohol and filtered through a tared filter; the filter is then dried and weighed. A portion of the residue is then warmed with a little sodium carbonate solution, filtered, acidified with hydrochloric acid, and made faintly alkaline with ammonia. In presence of sodium silicate, the characteristic silica precipitate will be obtained.—Pharm. Journ., June 3, 1905, 821; from Journ. Pharm. Chim. (6), *21* (1905), 496.

Ricin Soap—Preparation and Uses.—Frederick T. Gordon directs attention to the remarkable effect of a potash or soda soap of castor oil in making substances of a widely different nature soluble in or miscible with water. The soda soap of castor oil, which the author has called "ricin soap," is easily made, cheap, and has many qualities of usefulness to recommend it to pharmacists. The formula which the author found best for making the soap is the following: Dissolve 75 Gm. of caustic soda (the kind that comes in cans) in 100 Cc. of water, bring to a boil and pour in, with constant stirring, 100 grams of castor oil. The mixture will froth considerably at first, so a capacious vessel must be used, a sauce pan, agate, for instance, holding four times this amount. Keep the mixture at a boil until it becomes perfectly clear and transparent; the oil is then completely saponified. If the heat is now withdrawn a soft, jelly-like soap will result; it is therefore better to continue the heat until a few drops of the soap taken out on a glass rod harden on cooling; this will make a soap the consistency of castile soap, the easiest to work with. Pour the melted soap into well-greased moulds and set aside in a cool place to "set." When perfectly hard, cut up into pieces of suitable size. If the soap is cut in thin slices and dried in the sun it becomes hard and horn-like, transparent, and can then be easily powdered. The soap made as here out-

lined is hard, white, lathers freely with water, has a slight odor of castor oil and keeps perfectly, becoming more translucent on age and drying. The potash soap made similarly is much softer, but can be got in hard cakes by evaporation while melted. In making this soap, it must be stirred frequently to keep it from frothing and boiling over, unless the heat is regulated at just a boil. These proportions are of course based on the molecular formulas of the alkali and the oil, round numbers being taken for molecular weights. Seventy-five grams of soda, an excess, is best taken. The excess of alkali is to allow for any deficiency in strength in the commercial caustic soda; it is also an advantage to have the soap alkaline instead of neutral, as this enhances its power of removing dirt and grease. A perfectly neutral soap can be made that is an excellent one for toilet use, softening and whitening the skin. With the soda soap, prepared as above described, the author made a number of experiments which clearly point out its utility. Dry ricin soap dissolves freely in most oils, some essential oils, such as those of cloves, cinnamon, turpentine and eucalyptus, and copaiba, glycerin, etc., by heating the two together at a gentle heat. With oil of cloves, for instance, a clear solution is obtained by mixing 5 Cc. of the oil and 5 Cc. of soap solution (equal to 1.25 Gm. of the soap) with 10 Cc. of water; and this on the further addition of water (20 to 50 Cc.) produces an emulsion that can be diluted at will to 500 Cc., and which remained permanent for over two weeks, when it was thrown out. Similar results were obtained with the other oils mentioned. With castor oil, also, perfect emulsions can be obtained. All these emulsions are made by mixing the alcoholic solution (25 per cent.) of ricin soap with the oil and adding the desired amount of water and shaking. But the remarkable properties of ricin soap stand out clearest in phenols and similar bodies. Thus one gram of naphthol, 1 gram of soap, and alcohol to make 5 Cc., makes a clear solution with water in proportions from 5 to 40 Cc. of water; above the latter the mixture turns milky and the naphthol separates out on further dilution. Menthol, thymol, eucalyptol, etc., act in the same way as naphthol. All these solutions are perfectly clear; the substance is actually dissolved in the water by aid of the soap, not just mixed with it.—Drugg. Circ., Aug., 1904, 163–164.

Ricin Soap—Replacement by Castile Soap.—Referring to the above observations of Mr. Gordon concerning the utility of a castor oil soap for rendering oils, etc., soluble in or emulsifiable with water, H. A. B. Dunning states he has made some experiments on the lines laid down by Mr. Gordon and found that powdered castile soap would act much the same as the ricin soap. That is, 1.25 Gm. of powdered castile soap, dissolved in 5 Cc. of alcohol and mixed with 5 Cc. of oil of cloves, will make a clear solution with 5 Cc. of water, and may be diluted with 5 Cc. of water additional with only a faint cloudiness at first. Powdered castile soap dissolves in a number of the volatile oils, and these solutions, when diluted with water, form excellent emulsions.—Drugg. Circ., Febr., 1905, 45.

Zinc Superoxide Soap—Preparation and Uses.—Experiments have shown that zinc superoxide in combination with soaps of any kind exerts pronounced antiseptic action, and such a soap is now exploited in Germany for dermatalogic and surgical use. It may be prepared from ordinary soap by melting 88 parts on a steam-bath and adding, with vigorous stirring, 20 parts of a moist paste containing 50 per cent. of the zinc superoxide. On cooling, the soap so obtained contains 10 per cent. of the medicament, and may be cut up into pieces of appropriate size.—Pharm. Ztg., *50*, No. 10 (Febr. 4, 1905), 102.

SPIRITUS.

Spiritus Ammoniæ Aromaticus, B. P.—Indefiniteness of Official Formula.—S. Judd Lewis calls attention to the failure of the B. P. to say what should be the amount of product obtained by following the official formula for aromatic spirit of ammonia. For the sake of uniformity it would be desirable to dilute the distillate to exactly 1 gal. As the result of making a considerable number of 16-gal. batches on these lines, the following figures have been obtained: Sp. gr., 0.895–0.896; alcoholic strength, 17.78 o. p. (usually varying between 17.60 and 18.10 o. p., the extreme values being 16.7 and 18.6 o. p.). When only 8 gals. were made a somewhat lower strength was obtained. It should be remarked that in order to get this average the last runnings of the previous batch were added in place of so much water, and a very efficient condenser was used.—Chem. and Drugg., Nov. 5, 1904, 778.

Spirit of Nitrous Ether—Review of U. S. P. Methods of Preparation.—Willis St. L. Furbush reviews the U. S. P. methods of preparing spirit of nitrous ether, gives the results of experiments made to ascertain the respective advantages of the modern methods of preparation, particularly with regard to the proposed method of obtaining the concentrated ether by decantation from the products of the reaction; describes a convenient nitrometer for the assay of the spirit, and gives the results of assay of twenty commercial samples purchased in different stores in Massachusetts. He found only a single sample to contain the required 4 per cent. of ethyl nitrite and even that was strongly acid, as were all the others. He concludes from his experiments and observations: That the U. S. P., 1890, method is the best one tried for manufacture. In making ethyl nitrite, distillation is quicker and easier than decantation. The 1890 method of assay is practical, quick, easy and fairly accurate. While the commercial samples are poor, the spirit as sold in the stores shows a great improvement in the last ten years, this being attributable to the introduction and use of the "concentrated" nitrous ether. The pharmacist, however, should make his own ethyl nitrite instead of buying it, both because it is cheaper, and because he has the satisfaction of knowing it to be of proper quality and strength. It should be made in small quantities, and stored

in full, small bottles in a cool, dark place. While absolute alcohol would be best for diluting the concentrated ether, deodorized alcohol at least should be used.—Journ. Alumn. Assoc. Mass. Col. Pharm., June, 1905, 6–14.

SUCCI.

Fruit Juices—Normal Alcohol Content.—The German Imperial Health Bureau has established the normal alcohol content of fruit juices in accordance with results obtained experimentally with juices of known identity and quality, which are shown in the following table, together with the alcoholic content of the fruit syrups prepared from them :

Fruit.	Alcohol in 100 Cc. of	
	Juice.	Syrup.
Raspberries	1.93–3.99 Gm.	0.21–1.44 Gm.
Cherries	1.28 Gm.	0.42 Gm.
Blueberries	2.24 "	0.74 "
Currants (red)	2.34 "	0.74 "
Currants (white)	0.94 "	0.52 "
Cultivated Strawberries	2.44 "	0.52 "
Wild Strawberries	2.54 "	0.94 "

In the preparation of syrups, the quantity of alcohol naturally produced in the juices by fermentation, is reduced by vaporization during the heating necessary. Nevertheless, the syrups invariably contain some alcohol as a normal constituent, and the demand that fruit syrups shall be absolutely free from alcohol is therefore not justified. A normal content of even as much as 2 Gm. of alcohol in 100 Cc. of a fruit syrup is not regarded as excessive. It is permitted, also, to add alcohol to fruit juices, with the object of preserving them, but no limit is prescribed for such addition. The amount of alcohol so added may be estimated from the amount found in the syrup, ⅔ or ¾ of the alcohol present originally, being vaporized and lost during the boiling of the syrups.—Pharm. Ztg., 50, 45 (June 7, 1905), 475 ; from Ztschr. f. öff. Chemie, 1905, No. 9.

SUPPOSITORIA.

Suppositories—Preservation in Block-tin Moulds.—In a paper read by C. E. Vanderkleed at the meeting of the Pennsylvania Pharmaceutical Association, a method of encasing the official suppositories in block-tin moulds, supplied for this purpose, is described at length, together with the mechanical appliances necessary for this purpose and for preparing the cacao-butter suppositories by cold compression. The paper cannot be abstracted without going into greater detail than is warranted for this re-

port, and must therefore be consulted in the original, in Proceedings.—Penna. Pharm. Assoc., 1904, 61–72.

SYRUPI.

Syrups—Addition of Glycerin as a Preservative.—As far back as 1870 J. B. Moore had experimented to revise and improve the formulas and processes for preparing the syrups of ipecac, senega, senna and wild cherry, and after much time and labor, he had devised a simple formula and process for each, which yielded syrups satisfactory in every respect, and which are of indefinite permanency. These were published in different pharmaceutical journals at the time, but do not appear to have received the attention which they seem to merit. He now, in connection with an improved formula for "Compound Syrup of Squill" (which see), again calls attention to the value of the addition of glycerin as a perservative for the official syrups. Samples of these syrups, now thirty-five years old, are in a perfect state of preservation. In all the formulas for these syrups he employed glycerin in the proportion of twenty-five per cent., but he has no doubt that a smaller proportion of it might have answered, although this must be the subject of experiments which he has not made. Doubtless there are other syrups besides those named that may be rendered more stable by its use, as well as other galenical preparations which might be improved by the addition of 10 to 20 per cent. of glycerin.—Drugg. Circ., Dec., 1904, 263–264.

Syrups—Method of Sterilization and Preservation.—Wieblitz has found the following method quite efficient for preserving syrups that are liable to change rapidly under ordinary methods of keeping: The syrup, for instance syrupus althaeæ, is filled into previously heated small vials *to overflowing at a boiling temperature*, and the mouth of the vial is then covered with a disc of filter-paper cut to suitable dimensions. The paper at once absorbs syrup, becoming completely saturated, and after cooling becomes permeated with a crystalline deposit of sugar, which causes it to adhere firmly to the edge of the vial-mouth, and at the same time closes it hermetically. The edge of the mouth of the vial should be flat and uniformly smooth. In this way syrups, which under ordinary conditions are rapidly rendered unfit for use, will usually keep unchanged for a long time.—Pharm. Ztg., *49*, No. 60 (July 27, 1904), 629.

Syrup of Calcium Lactophosphate—Expeditious Method of Preparation. Francis Hemm recommends the following expeditious method for preparing a syrup of calcium lactophosphate, which, while conforming correctly to the U. S. P. requirements, enable the supply at short notice of a perfectly fresh preparation: Mix 6 Cc. of lactic acid and 8.6 Cc. of phosphoric acid, with 20 Cc. of distilled water and 2.5 Cc. of orange-flower water; add 2.5 Gm. of precipitated calcium carbonate to the mixture, triturating until it is completely dissolved and effervescence ceases. Then filter the solu-

tion into about 67 Cc. of extra heavy syrup, mix and make the measure up to 100 Cc. if necessary, by the addition of sufficient syrup.—Proc. Missouri Pharm. Assoc., 1904, 73.

Syrup of Ferrous Iodide—Modification of Manipulation.—H. A. B. Dunning has made the practical observation that if, after having brought the solution of ferrous iodide to near boiling, it be allowed to stand an hour or more in the presence of a few grams of sugar, until the clear green solution forms a supernatant layer above the black deposit, then heated near to boiling again and filtered into the syrup in the usual manner, the iron iodide solution never fails to be a beautiful green. Then if 4 Cc. of hypophosphorous acid, 50 per cent., be added for each 1,000 grams, the syrup will keep perfectly.—Drugg. Circ., Feb., 1905, 45.

Aubergier's Syrup of Lactucarium—Expeditious Methods of Preparation.—Prof. Francis Hemm suggests the following methods of preparing Aubergier's syrup of lactucarium corresponding to the formula given many years ago by Prof. Wm. Procter, Jr., which, it should be remembered, is a very much weaker preparation than the official syrup of lactucarium:

a. Tincture lactucarium (U. S. P.)	15 Cc.
Citric acid	2.0
Orange flower water	60 Cc.
Syrup, sufficient quantity to make	1000 Cc.

Mix. If necessary strain through cotton or filter.

b. Syrup lactucarium (U. S. P.)	150 Cc.
Orange flower water	60 Cc.
Citric acid	2.0
Syrup sufficient to make	1000 Cc.

This necessitates the carrying in stock of only the U. S. P. syrup or tincture to be in readiness to dispense fresh Aubergier's syrup at great saving in the cost of the marketed article.—Meyer Bro.'s Drugg., July, 1904, 191.

Syrupus Iodotannicus—Improved Formula.—Harold Wyatt, after a critical review of the different formulas, proposed and in use, for preparing iodotannin syrups, finds the following, based on that of the "Extra Pharmacopœia," to give the most satisfactory preparation: Iodine, 320 grains; tannin, 320 grains; sugar, 12 ounces; tincture of vanilla (1:40), 80 minims; freshly-roasted coffee, 2 ounces; water, enough to make 20 fluid ounces. Make a strong infusion of the coffee by percolation with boiling water until 4 ounces of percolate are obtained; set this aside and continue the percolation until 4 ounces more are obtained. Rub the iodine fine and put it and the tannin in a flask with the second percolate and 1 ounce of the sugar, and heat the mixture until the iodine is absorbed. Then add the first percolate and the remainder of the sugar, and when the latter is

dissolved, adjust to 1 pint (= 20 fluid ounces imp. measure), adding the tincture of vanilla last. The coffee has been found best to mark the taste of the iodotannin compound. The thin, dark syrup produced has a pleasant odor and taste.—Pharm. Journ., Dec. 17, 1904, 898.

Syrupus Iodotannicus—Formula Proposed for the "Codex."—Dissolve 2.0 Gm. of iodine and 4.0 Gm. of tannic acid in 60.0 Gm. of water on a water-bath, allow the solution to cool and filter. Add the filtrate to 100.0 Gm. of syrup of rhatany, evaporate the mixture to 120.0 Gm., and mix it with 880.0 Gm. of simple syrup. To obtain

Syrupus Iodotannicus Phosphoricus, 20.0 Gm. of soluble calcium monophosphate are dissolved in 980.0 Gm. of the syrup of iodotannin.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726; from Journ. de Pharm. et Chim., 1904, *xx*, No. 4.

Syrupus Rhei, B. P.—Improved Process.—Prof. Henry G. Greenish observes that the syrup of rhubarb of the B. P. is admittedly an imperfect preparation, and suggestions for its improvement are not wanting. He now records the details of experiments made to ascertain the value of the different recommendations, and as the result of his investigation suggests the following as a formula, giving a good product which will keep well for a reasonable length of time:

Rhubarb root (cut small)	2 ozs.
Oil of coriander	5 minims.
Alcohol	60 minims.
Water	15 fl. ozs.
Sugar	24 ozs.

Macerate the rhubarb with the water for twelve hours, strain and press; filter the liquid, raise the filtrate to the boiling-point for a minute and cool; for every 12 fl. ozs. of filtered liquid add 24 ozs. of sugar, and dissolve with the aid of a gentle heat. Finally add the oil of coriander dissolved in the alcohol.—Pharm. Journ., Nov. 19, 1904, 734–736.

Syrupus Rhei, B. P.—Modification of Formula.—Walter Henry Lenten recommends the preparation of syrup of rhubarb, B. P., from a 1 : 2 liquid extract of rhubarb flavored with coriander, using 1 part of this to 7 of simple sugar. The liquid extract is best prepared by repercolation with 20 per cent. alcohol containing about 5 per cent. of glycerin. For every pound of rhubarb add half a pound of coriander in coarse powder. This quantity of coriander greatly facilitates percolation, rhubarb by itself being frequently found difficult to percolate with a weak alcoholic menstruum. It is important that the rhubarb be not in too fine a powder for this same reason—a ten to twenty powder generally gives satisfactory results. Oil of coriander in the proportion of half a minim to each fluid ounce of finished extract should be added to bring up the aroma. This method will be found to give better results than if the full quantity of coriander fruit is

used, as in so doing the bulk of marc is inconveniently increased without any apparent compensating advantage.—Pharm. Journ., May 6, 1905, 652.

Compound Syrup of Squill—A Satisfactory Formula and Process.—Having made a series of careful experiments with the view to the improvement of compound syrup of squill, J. B. Moore has devised the following formula and process, which he unhesitatingly avers will produce a faultless preparation if the directions are carefully followed:

Squill in No. 30 powder	4 troy ounces.
Senega in No. 30 powder	4 troy ounces.
Sugar, granulated	27 troy ounces.
Glycerin	12 fluid ounces.
Tartar emetic	48 grains.
Diluted alcohol	sufficient.
Water	sufficient.

Mix the squill and senega, and having moistened the mixture with diluted alcohol, transfer it to a suitable glass funnel prepared for percolation, and pack it with moderate pressure, and gradually pour diluted alcohol upon it, until 3 pints of tincture have passed. Carefully evaporate this by means of a water-bath, at a temperature not exceeding 140° F., with frequent stirring, until it is reduced to 18 fluid ounces. When cool filter through paper, and add through the filter sufficient water to make the filtered liquid measure 18 fluid ounces. Transfer the filtered liquid to a bottle containing the sugar, then tightly stopper, and set it aside in a warm place, and shake it frequently, during twenty-four hours, or until the sugar is dissolved. Then place the bottle, which must be kept in perfect repose and resting upon a bed of excelsior, or folded paper, in a water-bath, which must be maintained at a temperature of 140° for two hours, or until a coagulum has formed, which will appear in clots through the syrup. The syrup should then, and while still hot, be poured upon a coarse muslin or cotton flannel strainer, which should have been loosely stretched over a funnel, and well secured in order to prevent it from becoming displaced. The syrup should thus be allowed to drain through without expression, into a graduated bottle, to separate the coagulum, and when it has ceased dropping, at once thoroughly dissolve in it the tartar emetic. Lastly, add to the mixture the glycerin, mix well, and when cool, add sufficient water to make the whole measure 48 fluid ounces.—Drugg. Circ., Dec., 1904, 263.

Syrupus Stigmatum Maidis—Formula Proposed for the "Codex."—Extractum stigmatum maidis (see under "Extracta"), 12.5 parts; syrupus simplex, 990.0 parts.—Pharm. Ztg., 49, No. 69 (Aug. 27, 1904), 726; from Journ. de Pharm. et Chim., 1904, xx, No. 4.

Syrup of Tolu—Improved Formula.—J. B. Moore regards the formula of 1870 for preparing syrup of tolu, in which magnesium carbonate was

employed, to be perhaps the best ever offered by the U. S. P., and recommends a return to this method, under the following modification: Concentrated tincture of tolu (1 oz. balsam and sufficient alcohol to make 2 fl. ozs.), 5½ fluidrachms; granulated sugar, 26 troy ounces; magnesium carbonate, 5 drachms; boiling water, 1 pint; water, a sufficient quantity. Rub the concentrated tincture of tolu with the magnesium carbonate until they are most thoroughly blended, then add 2 troy ounces of sugar and continue the trituration until the whole is intimately mixed. Then gradually add the boiling water, with constant trituration. Transfer the mixture at once to a suitable half-gallon bottle containing 18 troy ounces of sugar, tightly stopper the bottle, shake it vigorously, and then immediately place it in a water-bath, resting the bottle upon folds of paper, to keep its bottom from direct contact with the bottom of the bath vessel, and digest the mixture for half an hour, at a temperature of from 130° to 140° F. Shake the bottle frequently, and when the mixture is cold, filter through paper, observing to pass sufficient water through the filter to make the filtrate measure 30 fluid ounces, and to this add the remainder of the sugar. Shake it occasionally until the sugar is dissolved.—Drugg. Circ., Nov., 1904, 240.

Syrupus Tolutanus, B. P.—Improved Process.—In view of the acknowledged imperfections of the official (B. P.) method for making syrup of tolu, Prof. Henry G. Greenish has experimented with the object of ascertaining the value of the process proposed by Farr and Wright in 1899 (see Proceedings 1900, 523), which consists in dissolving 4 ounces of tolu in 12 ounces of 90 per cent. alcohol, adding 26 ounces of water previously heated to 70° C., shaking vigorously in a bottle, and filtering clear after 24 hours' standing. The syrup was then made by adding the filtrate to seven times its volume of simple syrup. Prof. Greenish agrees with Farr and Wright that this process is much superior to the one at present official. It worked well and easily, although the diluted tincture had to be filtered three times before it was sufficiently bright. The resulting syrup was clear and decidedly more aromatic than a syrup prepared from the same balsam strictly according to the official directions. The proportion of alcohol present is not sufficient to be objectionab'e; the syrup after keeping for four months was of good color and flavor, and free from any benzene odor or unpleasant taste.—Pharm. Journ., Nov. 12, 1904, 701.

TABELLÆ.

Compressed Tablets—Disintegration Test.—S. Judd Lewis suggests the following method for determining the readiness with which a compressed tablet is likely to break up and disintegrate in the stomach, the method being considered as approximating to the natural condition: A piece of muslin is stretched over the top of a small funnel, drum fashion, and on it rests a flat spiral of wire about $\frac{1}{32}$ inch thick, on which the tablet is

placed, as shown by Fig. 42. At a height of 6 inches above the spiral is a jet, from which one large drop of solvent falls on the tablet every second. The value is then determined by the time required for complete disintegration. Water from the tap at the ordinary temperature usually gives sufficient indication of the property in question, but under special requirements the experiment may be made with liquids of special composition and at specific temperatures, the liquid being dropped from a suitable container and regulated by a pinch-cock, and the temperature of the liquid and apparatus maintained the same throughout the experiment.—Chem. and Drugg., Dec. 31, 1904, 1060.

FIG. 42.

Tablet Apparatus.

TINCTURÆ.

Tinctures—Suitable Menstrua, Proportions, and Method of Preparation.—E. Weiss communicates the results of experimental studies undertaken for the purpose of determining the most suitable method of preparing the official (Ph. Ger.) tinctures, the solvent best adapted, and the proper proportion of drug. In general, he gives preference to the process of percolation, basing his opinion on comparative results obtained by macerating the same drug for 8 days in closed vessels, at 30° C., with frequent agitation. In particular, he makes the following recommendations:

Tinctura Aurantii is best prepared from the *fresh* outer layer (flavedo) of the orange peel, with 70 per cent. alcohol, in the proportion of 1 : 5. These proportions also apply to the dried peel.

Tinctura Benzoes is best prepared with 80 per cent. alcohol, in the proportion of 1 : 5. So prepared, the tincture contains quite as much dissolved substance as when prepared with the official 90 per cent. alcohol.

Tinctura Calami, to be permanent, should be made with alcohol at least of 60 per cent. strength.

Tinctura Cascarillæ, is also best made with 60 per cent. alcohol, in the proportion of 1 : 5.

Tinctura Castorei is most satisfactory—containing abundant extractive and remaining clear for a long time—when made with 95 per cent. alcohol, in the proportion of 1 : 5.

Tinctura Catechu is apparently richer in extractive, in proportion to the weaker alcoholic strength of the menstruum. But the weaker alcoholic preparation filters with difficulty and afterwards forms deposits, whereas tinctures made with 80 and 90 per cent. alcohol are free from these defects and form scarcely any deposit on keeping.

Tinctura Chamomillæ gives the best preparation with 50 per cent. alcohol, as does also

Tinctura Cinnamomi—both tinctures being prepared in the proportion 1 : 5.

Tincturarum Gallarum, of high extract content and great stability is obtained with 50 per cent. alcohol.

Tinctura Guaiaci, is best prepared with 90 per cent. alcohol, 1 : 5.

Tinctura Ratanhiæ, should be prepared with 60 per cent. alcohol.

Tinctura Valerianæ, prepared with 50 per cent. alcohol, is in every respect a satisfactory preparation; while

Tinctura Vanillæ is best prepared with 80 per cent. alcohol.—Pharm. Ztg., *50*, Nos. 17 and 26 (Mar. 1 and April 1, 1905), 178 and 270; from Ztschr. d. Oesterr. Ap. Ver., 1905, Nos. 1–7 and Nos. 8–11.

Tinctures—Displacement of Alcoholic Menstruum by Water.—In Appendix viii to the B. P., towards the end of the directions given for preparing tinctures by the percolation method, it is directed that, on the cessation of percolation, the marc is to be removed from the percolator and submitted to pressure, the expressed liquid to be added to the percolate and the whole to be made up to the proper volume with a sufficient quantity of the menstruum. By this process a greater volume of menstruum is used than the volume of tincture made. The necessary addition of alcohol also adds to the expense of preparation, an expense which may amount to a considerable sum when large quantities of tinctures are prepared. Again, additional labor is required for pressing the marc, while the means of recovering the alcohol from the marc by distillation are too frequently not at hand. In order to ascertain whether tinctures could not be prepared by a process of percolation that would not entail the subsequent addition of fresh menstruum, and without showing any greater diminution in alcoholic strength than similar tinctures prepared by the official process, a number of tinctures were made by Hermann C. T. Gardner by a process, for which the author, however, does not claim originality, which he outlines as follows: The powdered drugs were moistened and set aside in the manner officially directed, to be later transferred to a percolator (glass), packed therein, and percolation allowed to proceed. After an amount of menstruum had been added, which, together with that portion used for moistening the powders, equalled the required volume of tincture, and after it had ceased to pass, a small piece of ordinary white paper was placed upon the top of the marc, and a volume of water carefully poured thereon equal to twice the deficient quantity of percolate. The process of displacement by water was stopped when the amount of percolate was made up to the required bulk of tincture. The results, as shown by a number of tables accompanying the author's papers, were quite as satisfactory as the pharmacopœial mode. Of the tinctures prepared—digitalis,

hydrastis, hyoscyamus, jaborandi, strophanthus, cardamom compound—the strengths of the menstrua were variously 45, 60, and 70 per cent. alcohol; the weights of the marcs ranged from 2 oz. to over 3 lb. The weight of marc is important, as it is very doubtful whether a very small marc can give a satisfactory result. Satisfactory results are apparently obtained when such quantities of tinctures are prepared that necessitate a marc having a weight in the dry state of at least 5 oz., and when packed firmly in the percolator. The width at the base of the percolator used in making these experiments was 3 in., a width not increasing by more than 1 in. in a height of 4½ in.—Pharm. Journ., April 15, 1905, 548-550.

B. P. Tinctures—Specific Gravity and Percentages of Extractive and Alcohol.—E. W. Lucas and A. D. Dick communicate a valuable table, recording the specific gravities and percentages of extractive and of alcohol in B. P. tinctures during the past six years, and representing batches varying from a few pints to a large number of gallons, which is here reproduced for convenient reference. The specific gravities were taken by standard hydrometer. The extractives resulted from evaporating suitable quantities (not less than 10 Cc.) from shallow, flat-bottomed, aluminum-bronze basins 3½ inches in diameter, and heating in water-oven for three hours, then weighing every hour until loss is not more than 3 Mgm. in an hour. In the experience of the authors the majority of extractives dry to constant weight in about four hours. The alcohols were determined by direct distillation, no previous treatment being resorted to for the removal of essential oils, etc.

	Spec. Grav. at 15.5° C.			Extractive (Gm. per 100 Cc.)			Per Cent. Alcohol (by Vol.).		
	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
Tr. Aconiti	0.903	0.895	0.900	1.70	1.20	1.50	68.0	65.8	66.0
Tr. Aloes	0.980	0.972	0.976	7.6	6.6	7.4	41.8	38.0	39.0
Tr. Arnicæ	0.900	0.894	0.896	0.79	0.65	0.71	69.5	66.0	67.6
Tr. Asafetidæ	0.919	0.914	0.916	10.0	9.0	9.7	63.0	60.0	62.0
Tr. Aurantii	0.885	0.879	0.882	1.86	1.57	1.69	75.8	72.0	73.6
Tr. Benzoin. Co	0.901	0.890	0.895	17.0	15.0	16.1	75.9	71.6	74.4
Tr Buchu	0.935	0.928	0.932	3.8	2.8	3.7	58.0	55.0	56.0
Tr. Calumbæ	0.926	0.918	0.920	1.1	0.80	0.86	58.0	55.5	57.0
Tr. Camph. Co	0.923	0.916	0.920	0.35	0.30	0.31	59.0	56.5	57.0
Tr. Cannab. Ind	0.850	0.846	0.847	4.1	3.4	3.7	87.0	84.8	86.0
Tr. Cantharidis	0.839	0.835	0.876	0.18	0.14	0.17	89.6	88.5	89.1
Tr. Capsici	0.898	0.892	0.895	1.2	0.96	0.98	69.0	67.0	68.0
Tr. Cardam. Co	0.955	0.949	0.952	7.1	6.1	6.6	54.1	52.2	53.3
Tr. Cascarillæ	0.903	0.898	0.900	2.5	1.99	2.3	67.0	64.5	66.0
Tr. Catechu	0.985	0.980	0.982	15.6	13.8	14.5	52.7	50.0	51.4
Tr. Chiratæ	0.925	0.921	0.923	1.13	1.05	1.10	57.9	56.9	57.2
Tr. Cimicifugæ	0.925	0.922	0.923	1.44	1.25	1.35	58.0	56.5	57.1
Tr. Cinchonæ	0.925	0.917	0.920	5.8	4.8	5.4	67.0	62.4	64.6
Tr. Cinchon. Co	0.918	0.914	0.916	4.8	4.1	4.5	65.5	62.8	64.7
Tr. Cinnamomi	0.904	0.900	0.901	2.1	1.45	1.8	66.5	65.5	66.0
Tr. Cocci	0.960	0.949	0.950	2.49	2.0	2.3	43.0	42.0	42.5
Tr. Colchici Sem	0.956	0.950	0.951	2.10	1.90	2.0	43.6	42.0	43.0
Tr. Conii	0.902	0.895	0.899	1.40	1.27	1.30	68.0	66.0	66.5
Tr. Croci	0.928	0.924	0.926	3.0	3.25	2 5	58.4	56.0	57.5
Tr. Cubebæ	0.845	0.840	0.843	1.43	1.25	1.35	86.2	82.0	84.0
Tr. Digitalis	0.935	0.932	0.933	3.60	2.86	3.36	56.5	54.6	55.8
Tr. Ergot. Am	0.942	0.936	0.938	3.90	2.70	3.29	51.2	50.1	50.8
Tr. Gelsemii	0.927	0.920	0.924	1.30	1.20	1.26	57.0	56.5	56.8
Tr. Gentian Co	0.967	0.961	0 965	4.9	3.5	4.2	43.0	41.8	42.3
Tr. Guaiaci Am	0.907	0.899	0.902	17.2	14.0	15.5	71.5	69.2	70.0
Tr. Hamamelidis	0.955	0.949	0.953	1.95	1.41	1.68	44.7	43.6	44.0
Tr. Hydrastis	0.930	0.929	0.929	2.55	1.97	2.30	56.0	55.6	55.8
Tr. Hyoscyami	0.959	0.950	0.954	3.1	2.7	2.9	43.0	41.5	42.0
Tr. Iodi	0.881	0.878	0.880	——	——	2.52%I	86.5	84.0	85.0
Tr. Jaborandi	0.959	0.957	0.958	2.90	2.45	2.68	43.0	42.0	42.4
Tr. Jalapæ	0.914	0.910	0.912	4.6	3.5	3.7	67.0	64.1	66.0
Tr. Kino	0.998	0.990	0.997	23.6	20.0	22.0	52.7	58.0	50.0
Tr. Krameriæ	0.941	0.938	0.940	4.9	4.6	4.8	56.0	53.6	55.0
Tr. Lavand. Co	0.840	0.839	0.840	0.52	0.46	0.50	88.6	88.0	83.3
Tr. Limonis	0.880	0.879	0.879	1.44	1.40	1.41	76.5	75.8	76.1
Tr. Lobel. Æth	0.816	0.812	0.814	1.48	0.80	1.40	——	——	——
Tr. Lupuli	0.944	0.938	0.940	4.0	3.6	3.8	54.1	49.8	54.0
Tr. Myrrhæ	0.857	0.849	0.853	4.8	3.9	4.4	94.8	83.4	84.1
Tr. Opii	0.959	0.955	0.957	3.6	2.8	3.3	44.7	43.6	44.1
Tr. Podophylli	0.848	0.844	0.847	3.6	2.96	3.4	87.5	85.5	86.5
Tr. Pruni Virg	0.932	0.931	0.931	2.7	2.3	2.4	54.1	53.7	54.0
Tr. Pyrethri	0.903	0.901	0.902	1.85	1.50	1.66	69.1	67.5	68.1
Tr. Quassiæ	0.908	0.944	0.946	0.47	0.16	0.38	44.7	42.0	43.5
Tr. Quillaiæ	0.927	0.921	0.922	1.38	0.93	1.20	57.9	55.5	57.0
Tr. Rhei Co	0.975	0.971	0.973	12.7	12.0	12.5	50.1	48.6	49.4
Tr. Scillæ	0.971	0.965	0.968	12.3	10.4	11.0	52.1	51.2	51.8
Tr. Senegæ	0.945	0.938	0.941	5.0	4.3	4.6	55.1	54.6	54.7
Tr. Sennæ Co	0.991	0.985	0.987	9.0	8.1	8.3	40.0	38.5	39.2
Tr. Serpentariæ	0.901	0.896	0.898	2.0	1.28	1.5	68.0	66.1	67.0
Tr. Stramonii	0.962	0.952	0.958	3.6	3.2	3.4	43.9	42.1	43.0
Tr. Strophanthi	0.897	0.894	0.895	0.68	0.42	0.51	69.0	68.3	68.6
Tr. Sumbul	0.906	0.901	0.903	2.70	2.19	2.41	67.0	64.5	66.1
Tr. Tolutanæ	0.868	0.864	0.866	8.3	6.8	7.9	83.7	81.0	82.0
Tr. Valer. Am	0.944	0.939	0.941	3.68	2.51	2.98	50.7	49.1	50.2
Tr. Zingiberis	0.844	0.839	0.840	0.37	0.30	0.35	88.5	87.0	88.0

—Pharm. Journ., Mar. 11, 1905, 362.

Astringent Tinctures—Valuation by Means of Formaldehyde.—E. Weiss, in the course of his experiments on *Tinctures* (which see), describes a method for the valuation which depends on the amount of condensation-product produced by the action of formaldehyde on the phenols (tannin) contained in the tincture. As applied to *tincture of catechu*, the process is carried out as follows:

10 Cc. of the tincture are introduced into a 250 Cc. porcelain dish and the rinsings of the measuring-glass, with 20 Cc. of water, are added, followed by 15 Cc. of formaldehyde (38 per cent.) and 40 Cc. of concentrated hydrochloric acid. A dense red-brown precipitate is thus produced, even in the cold. The dish is now placed on the water-bath and evaporated, with assiduous stirring, to about one-half the original volume. It is then diluted with 200 Cc. of water, the precipitate collected on a Gooch-filter and washed with 250 Cc. of water by the aid of the suction pump, and finally dried in a water-drying oven, and weighed. The weight so ascertained is calculated for 100 parts of the tincture, and constitutes the "Formaldehyde Number" of the tincture. In a similar manner, which must be modified, however, slightly in each case, according to the quality of the phenols (tannin) present, or the properties of the condensation-product, the author has determined the following:

FORMALDEHYDE NUMBERS IN TINCTURES.

	Alcoholic Strength of Tincture.					
	90 Per cent.	80 Per cent.	70 Per cent.	60 Per cent.	50 Per cent.	40 Per cent.
Catechu	11.72	12.7	13.09	13.22	14.0	14.64
Cinnamon	0.480	0.562	0.725	0.850	1.070	1.108
Galls	9.08	10.24	10.55	9.0	11.53	10.10
Rhatany	5.87	6.22	6.57	6.49	6.38	6.00

—Pharm. Ztg., *50*, No. 26 (Apr. 1, 1905), 270; from Ztschr. d. Oesterr. Ap.-Ver., 1905, Nos. 8–11.

Tinctura Cardamomi Composita, B. P.—Modification of Formla.—E. W. Lucas and H. B. Stevens discuss the formula and composition of compound tincture of cardamon B. P. from the historical and practical standpoint, and as a result of their investigations and experiment recommend its preparation on the lines adopted in the recent revisions of the U. S. P., as follows:

Cardamon-seeds, bruised	¼ oz.
Caraway-fruit bruised	¼ oz.
Cinnamon-bark, bruised	½ oz.
Cochineal, in powder	55 gr.
Glycerin	1 fl. oz.
Alcohol, 60 per cent.	q. s.

Macerate the cardamoms, caraways, cinnamon, and cochineal in 18 fl.

oz. of the alcohol. Press, filter, and make up to one pint with the menstruum.—Chem. & Drugg., Mar. 25, 1905, 490.

Fat-Free Tincture of Digitalis—Preparation.—Frank E. Mott gives the details for preparing a fat-free and neutral tincture of digitalis. The powdered leaves are extracted by alternate maceration and percolation with naphtha (petroleum ether ? Rep.) until the latter proves colorless; the fat-free leaf-powder is then dried at not exceeding 50° C., and extracted by percolation with diluted alcohol until, when 1000 Cc. of tincture are to be made, 950 Cc. of percolate have been obtained. The amount of ammonia required to exactly neutralize the tincture is then ascertained by diluting 0.5 Cc. of the percolate with distilled water to 100 Cc. and having added 2 Cc. of rosolic acid indicator (U. S. P.), titrating with ammonia water diluted with water in proportion 1 : 5000. Neutrality is indicated sharply by a change from yellow to purple in a porcelain capsule. The calculated quantity of ammonia water is then added, followed by sufficient diluted alcohol to make 1000 Cc. of tincture.—Jour. Alumni Assoc., Mass. Col. Pharm., June, 1905, 14.

Tincture of Digitalis—Necessity for Protection from Light.—Dr. C. Focke, in continuation of his investigation of the changes to which digitalis leaves are subject (see Proceedings, ——) has extended his investigations to the tincture. He finds that the activity of the tincture, as is the case with the leaves, is diminished by age. Physiological experiments made upon animals show that this diminution in activity amounts to between 10 and 17 per cent. in the course of a year, if the tincture is preserved in the dark; but if exposed to light during this period its physiological activity is reduced to two-thirds or even as much as one-half of that it had originally manifested. Tincture of digitalis should therefore be renewed at least once a year and should during that period be carefully excluded from light. Moreover, the tincture should be standardized by the physiological method heretofore recommended and described by him.—Pharm. Ztg., *49*, No. 52 (1904), 543.

Tincture of Digitalis—Chemical and Physiological Assay.—See *Digitalis* under "Materia Medica."

Tincture of Iodine—Estimation of Iodine.—H. Frerich's recommends the direct method of estimating the iodine in tincture of iodine, recently recommended by Klut, as being reliable, and gives the following directions, suitable for pharmacopœial definition: 5 Cc. of tincture of iodine should require not less than 30.2 Cc. of $\frac{1}{10}$ N. thiosulphate solution, for complete decoloration. An indicator is not necessary.—Apoth. Ztg., *20*, No. 2 (Jan. 7, 1905), 13.

Tinctura Strophanthi—Physiological Standardization.—G. Santesson, in view of the greatly variable activity of tincture of strophanthus supplied in different Danish pharmacies, as recently demonstrated, regards it as

very desirable that this tincture be standardized by physiological methods. The requirement should also be made that the tincture should give the well-known green reaction with concentrated sulphuric acid.—Münch. Med. Wschr., 1905, No. 6.

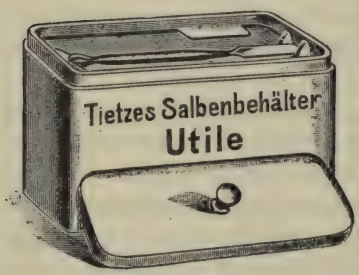
The editor of the "Pharm. Ztg." (Mar. 1, 1905, 178) remarks in this connection that the recent investigations of Gilg. Thoms and Schedel (see Proceedings, 1904, 668), have pointed out that the physiological standardization of tincture of strophanthus, which at best is very troublesome, may probably be avoided by employing the seeds of

Strophanthus gratus for preparing the tincture. These seeds are less liable to be mistaken or substituted by other sorts than are those of the Kombé strophanthus, and are characterized by uniform and reliable activity.

UNGUENTA.

Ointment Container—Practical Construction.—Oskar Tietze has devised the convenient and efficient ointment container shown by Fig. 43, which requires little explanation. It is provided near the upper edge on the interior with a short horizontal extension, on which the excess of ointment adhering to the spatula is conveniently scraped off. Each container is also provided with a spatula, which, when not in use, rests lengthwise on opposite ledges extending for a short distance from the narrower interior walls near the rim. In form and construction these containers are quite pleasing, while their cleanliness and convenience is obvious.—Pharm. Ztg., *49*, No. 67 (Aug. 20, 1904), 706.

FIG. 43.



Ointment Container.

Unguentum Acidi Carbolici, B. P.—Improved Formula.—Prof. Henry G. Greenish has investigated the different improved formulas which have been suggested for preparing the official (B. P.) ointment of carbolic acid, and recommends the following, originally suggested by Morley Taylor, as a distinct improvement over the official one:

Phenol	1 part.
Hard paraffin	6 parts.
Soft paraffin	18 parts.

The two paraffins are melted together in a water-bath and the phenol added. The latter evidently dissolves perfectly, since there is no evidence of separation on cooling.—Pharm. Journ., Nov. 19, 1904, 737.

Carbolic Acid Ointment—Formula for a "Causticless" Preparation.—Sam Bayne recommends the following formula for preparing an ointment

of carbolic acid in which the caustic effect of the carbolic acid is neutralized with camphor, without impairing its antiseptic properties. Melt 2½ drachms of carbolic acid with 4 drachms of camphor, and while warm add 15 minims of oil of sassafras. Melt 6 drachms of white wax, 1 ounce of lanolin and 8 ounces of white petrolatum (refined) together, and add the carbolic-acid-camphor mixture, stirring occassionally while cooling.—Proc. Georgia Pharm. Assoc., 1904, 74.

"Camphor Snow"—A Non-Greasy Substitute for Cold Cream.—M. I. Wilbert offers the following formula for preparing a non-greasy substitute for cold cream, for which he suggests provisionally the name of "camphor snow:" Dissolve 3 Gm. of agar-agar in 150 Gm. of water and strain. To 100 Cc. of water in a farina boiler, or any suitable dish on a water-bath, add 15 Gm. of stearic acid and 10 Gm. of sodium carbonate and heat until the carbon dioxide has been driven off, add 15 Gm. of oil of theobroma and the solution of agar-agar, and mix them thoroughly by means of an egg-beater. Then remove the dish from the water-bath, and continue beating the mixture until a uniformly smooth lather, measuring about three times the volume of the original material results. When nearly cold, add 5 Gm. of camphor, dissolved in 10 Gm. of alcohol. The preparation can be varied by substituting any desirable perfume for the camphor, using any fatty oil, or replacing the agar-agar by Irish moss or casein, etc.—Amer. Journ. Pharm., March, 1905, 128–129.

Unguentum Conii, B. P.—Modified Formula.—Instead of using hydrous wool-fat, which not infrequently fails to take up more water, and consequently gives rise to trouble when preparing unguentum conii, B. P., Walter Henry Lenton suggests the use of anhydrous wool-fat, and recommends the following formula:

Conium juice	2 fl. oz.
Wool-fat (anhydrous)	½ oz.

Evaporate the conium juice to ½ ounce by weight and incorporate with the wool-fat in a slightly warmed mortar. This yields an elegant and satisfactory ointment, which is of nice consistency. The process is less troublesome than that of the Pharmacopœia; moreover, the conium juice is subjected to heat for a much shorter period.—Pharm. Journ., May 6, 1905, 652.

Unguentum Diachylon, Ph. G., iv.—Proposed Improvement.—Köbrich observes that the substitution of olive oil in the Ph. G., iv, for the linseed oil, originally directed by Hebra for preparing diachylon ointment, has not improved this preparation, which is subject to the same imperfections. By substituting liquid paraffin, however, for the olive oil—thus, emplastrum plumbi, ol. paraffin. liquidum album, āā partes aequales—a perfectly smooth and stable preparation is obtained.—Pharm. Ztg., 50, No. 12 (Febr. 11, 1905), 124.

E. Stützner, referring to the above suggestion, observes that the diachylon ointment prepared with paraffin oil is too soft in summer, and recommends the substitution of a portion of the oil by solid paraffin in the proportions as follows: Empl. litharg., 500; paraff., solid, 65; paraff., liquid, 435 parts.

On the other hand, Robert Kuester objects to the use of paraffin oil, for although a very smooth and stable ointment is thus produced, it suffers in efficiency, because the absorptive and drying properties, due to the vegetable oils, are completely eliminated by the use of the mineral oils.—*Ibid.*, *50*, No. 15 (Febr. 22, 1905), 158.

Galen's Cerate (*Can. N. F.*)—*A New Form of Cold Cream.*—The following formula for Galen's cerate is given in the "Compendium" or Canadian National Formulary:

Liquid paraffin	16 fl. ounces.
White beeswax	4 ounces.
Spermaceti	1 ounce.
Borax	30 grains.
Oil of rose	10 minims.
Distilled water	8 fl. ounces.

Dissolve the borax in the distilled water; melt the white beeswax and spermaceti with the liquid paraffin at a gentle heat; pour the mixture into a warmed mortar and add while yet hot the borax solution, previously warmed, with constant trituration, and finally the oil of rose; continue the trituration until cold.

In hot weather the quantity of white beeswax may be increased to 5½ ounces and the spermaceti to 2 ounces.—Pharm. Era, April 27, 1905, 471.

Ointment of Mercuric Nitrate.—Preparation with Mercuric Oxide in Place of the Metal.—Clarence O. Snavely * recommends the use of mercuric oxide (previously recommended by Rother) in place of metallic mercury for preparing the solution of mercuric nitrate. The formula (of 1890) would then have to be modified as follows: Red mercuric oxide, 75.5 Gm.; nitric acid, 175 Gm.; lard oil, † 760 Gm. The lard oil is to be heated to 100° C. (212° F.), the heat withdrawn, 100 Gm. of the acid slowly added, and, when the reaction moderates, heat applied until effer-

* The authorship of this paper is credited to Mr. J. H. Redsecker, of Lebanon, Pa., in the Proceedings from which this abstract was made, but in a foot note to a reprint of this paper, in Amer. Journ. Pharm., May, 1905 (p. 233), it is stated that Mr. Redsecker disclaims the authorship, and that he merely presented it in Mr. Snavely's behalf.

† In the U. S. P., 1900, lard oil has been abandoned in favor of lard, not so much, because the oil is unsuitable, but mainly because of the difficulty to secure lard oil of absolute and guaranteed purity. As pointed out by a member of the sub-committee on cerates, ointments, etc., it is an easy matter to guard against adulterated lard by procuring the leaf-fat and rendering it. It is practically impossible to prepare the oil from the lard, however pure it may be.—Rep.

vescence ceases. "Positively at this point in the process the liquid should not be disturbed by stirring. Now, when all the nitric acid has been decomposed, the temperature can be considerably raised without causing further effervescence, and the liquid simply boils." After maintaining this elevated temperature ten or fifteen minutes, the liquid is allowed to cool to about 40° C. (140 F.). The cold prepared solution of the mercuric oxide in the remaining (75 Gm.) of the acid is then added in small portions, and the mixture heated and maintained at 60° C. until no further evolution of gas takes place, then withdrawn entirely. When completely cooled, the ointment is thoroughly triturated, preferably by the use of a glass rod. The advantages claimed are: 1. A definite solution of mercuric nitrate. 2. The availability of a larger proportion of acid to oxidize the fat. 3. An ointment true to name, being free from mercurous nitrate. 4. An ointment devoid of odor in great degree. 5. An ointment physiologically more active than when accompanied by a mercurous salt.—Proc. Penna. Pharm. Assoc., 1904, 167–173.

Petroleum Cold Cream—Formula.—M. D. Hodges recommends the following formula for preparing a "light cold cream," which is successful under the employment of "a good egg-beater and plenty of elbow grease:" Melt 4 ounces of paraffin and 2 ounces of white wax together on a water-bath, remove from the bath, add 1 pint of liquid albolene (or white paraffin oil), and beat the mixture briskly until cold. Perfume with oil of rose or rose geranium.—Proc. Georgia Pharm. Assoc., 1904, 75.

Compound Resorcin Ointment—Formula.—The "Compendium" or Canadian National Formulary gives the following formula for compound resorcin ointment:

Resorcin	565 grains.
Zinc oxide	565 grains.
Bismuth subnitrate	565 grains.
Oil of cade	2⅝ fl. ounces.
Soft paraffin, white	7 ounces.
Hydrous wool-fat	7 ounces.

Triturate the resorcin to a fine powder with the aid of a little ether, and allow the ether to evaporate; then mix the powders and incorporate with the remainder of the ingredients. Darkens on exposure to air and light, and should be kept in well-closed containers.—Pharm. Era, April 27, 1905, 471.

Skin Cream—An Australian Formula.—M. J. Arneson, an Australian pharmacist, publishes the following formula for a "skin cream," which has proven very satisfactory as an emollient preparation for the toilet: Bismuth carbonate, 5 Gm. (78 grains); zinc oleate (pulv.), 15 Gm. (232 grains); lanolin, 60 Gm. (925 grains); glycerin ointment, enough to make 500 Gm. (17½ ounces, av.); perfume, sufficient. The

Glycerin Ointment required for this preparation is obtained by triturating 50 Gm. (771 grains) of pulverized starch with 350 Cc. (12 fluid ounces) of water quite smooth in an evaporating dish, then adding gradually 200 Cc. (6¾ fluid ounces) of glycerin, and heating, with assiduous stirring, until a translucent jelly is formed. The perfume recommended is a good violet extract. A few drops of solution of carmine (N. F.) are added to produce the "blush." Mr. B. S. Cooban, to whom this formula was submitted, suggests that the zinc oleate and bismuth be first triturated with the lanolin until perfectly blended, then the "glycerin ointment" added *while hot*, and the whole well beaten to form a smooth, creamy product.—Bull. Pharm., Jan., 1905, 15–16.

Ungt. Sulfurat. Mite.—Preparation.—Dr. C. Stick communicates the following method of preparing a sulphurated lanolin base, which is an essential component of the specialties exploited under the names of sulfolan and thiolan (see Thiolan under New Remedies). Anhydrous lanolin is heated at 150° C. for several hours with 3 per cent. of precipitated sulphur, with constant stirring, and then filtered in a hot-water funnel. The solution so obtained may then be mixed with liquid paraffin or oils in proper proportion to form ointments or creamy mixtures of desirable consistence.—Pharm. Ztg., *50*, No. 38 (May 15, 1905), 400.

Zinc Oxide Ointment—Manipulation.—W. A. Hall suggests that, using a good article of zinc oxide and benzoinated lard, about ¼ of the lard is melted and rubbed with the zinc oxide in a capacious mortar. Then, having melted and partially cooled the balance of the lard, add it to the first portion in the mortar and stir until cool. Ointment thus made will be beautifully smooth and even.—Pharm. Era, Dec. 15, 1904, 205; from Proc. Mich. Pharm. Assoc., 1904.

VINA MEDICATA.

Vinum Iodotannicum Phosphoricum—Formula Proposed for the "Codex."—Dissolve 2.0 Gm. of iodine and 4.0 Gm. of tannic acid in 60.0 Gm. of water, on a water-bath. Allow the solution to cool, filter, add the filtrate 100.0 Gm. syrup of rhatany, evaporate the mixture to 120.0 Gm., and mix it with 860.0 Gm. of Malaga wine. In this mixture dissolve 20.0 Gm. of soluble calcium monophosphate, allow it to stand 24 hours and filter.

Vinum Kreosoti is also proposed for the "Codex," prepared according to the following formula: Creosote, 10.0 Gm.; alcohol (90 per cent.), 90.0 Gm.; simple syrup, 100.0 Gm.; Malaga wine, 800.0 Gm.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726; from Journ. de Pharm. et Chim., 1904, xx, No. 4.

MISCELLANEOUS FORMULAS.

Petroleum Preparations—Various Formulas under Coined Names.—F. E. Niece, in a paper presented at the meeting of the Pennsylvania Pharmaceutical Association, 1904, calls attention to the possibilities of petroleum

products for making a variety of pharmaceutical preparations, which under proper development may prove valuable additions to the armamentarium of the physician as well as for commercial exploitation. Primarily the object of this paper is to advance a few ideas and show the wide range of adaptability of these products in the shape of a formulary under coined names, with detailed directions for the manipulation; but these are by no means claimed to be perfected, and should therefore be accepted tentatively, to be revised or reconstructed as occasion or opportunity may demand. A few of these formulas may be mentioned here, as follows:

Petromul (Emulsion of Petroleum), a cod-liver-oil substitute, bland, stable, nutritive and palatable, prepared with liquid (amber) petroleum, 4 oz.; acacia, 4 oz.; calcium, sodium and potassium hypophosphites, a little glycerin, oils of bitter almond and clove, saccharin to sweeten, and sufficient water to make one pint.

Iodotol, an iodine application of paraffin with which ½ to 4 per cent. is incorporated by the aid of heat.

Quinatol, an ideal preparation for the hair, made by dissolving 2 to 4 per cent. of quinine (alkaloid) in paraffin oil, perfumed with bergamot oil, and colored with alkanet.

Alkapetroloids are preparations of various alkaloids in liquid paraffin, of different strengths according to requirement, obtained by warming until solution is effected.

Benzoinotol (*Petrobenzoinatus*), a soothing emollient, obtained by digesting 16 oz. of liquid paraffin, 1 oz. powdered benzoin, and ½ oz. of balsam of tolu together at a high temperature, and filtering this after cooling. This can be combined with various percentages of different medicaments, such as oil of *Pinus pumilionis*, pine tar, camphor, arnica flowers, menthol, ichthyol, hyoscyamus leaves, phenol, thymol, cantharides, etc.

Benzoparal is a neutral, bland, oily preparation for atomizing, nebulizing or vaporizing, obtained by heating 1 oz. of benzoin and 16 oz, of liquid paraffin for half an hour on a sand-bath; while

Benzopetrol is an excellent dermatological base for carrying solid medicaments to the skin, obtained by heating in the same way as the preceding, ½ oz. of benzoin and ¼ oz. balsam of Peru, with 16 oz. yellow or white petroleum (petrolatum?—Rep.).

Capsicolatum, a perfect counter-irritant ointment, is obtained by digesting 1 oz. of powdered capsicum with 4 oz. of yellow petroleum (petrolatum?—Rep.), for a few hours on a sand-bath, and filtering or straining it while hot.

Linimentum Paracapsicol is one of the most efficient liniments which can be used any place where there are no exposed (abraded?—Rep.) surfaces. It is made by digesting ½ oz. of powdered capsicum with 4 oz. of

paraffin oil on a sand bath and filtering, adding according to choice, oil of wintergreen, oil of peppermint, phenol, thymol, camphor, or eucalyptol, etc.

Carron Oil is improved by adding to equal parts of linseed oil and lime-water, one-fourth to one-half the combined volume of liquid paraffin.

The remaining preparations, some twenty or more, are mostly intended for the toilet, and must be referred to it, the original.—Proc. Penna. Pharm. Assoc., 1904, 186–199.

"Bijou" Cleaning Fluid—Formula.—Frank Farrington, discussing the subject of cleaning fluids, says that among the best ones, and perhaps not surpassed by any that can be sold at a popular price, is the so-called "Bijou cleaning fluid," for which he gives the following formula: Chloroform, 1 drachm: ether, 1 drachm; oil of gaultheria, 1 drachm; alcohol, 4 drachms; benzin, enough to make 2 pints.—Bull. Pharm, March, 1905, 114.

Catguts—Method of Disinfection with Benzol.—Beslier recommends the following method of disinfecting catguts: The catguts, wound on glass reels, are introduced into a copper bomb, fitted with a screw-cap, which contains pure crystallizable benzol. After securing the cap, the bomb is heated in an autoclave for twenty minutes, then cooled. The reels of gut are then removed, placed in separate flasks, which are then immersed, uncorked, in a fresh bomb of benzol. This is heated, as before, in the autoclave, the temperature being gradually raised until a pressure of two atmospheres is obtained. The apparatus is then allowed to cool down. When the bomb is cold, the screw cap is removed and the orifice plugged with wool, through which a syphon is passed, and the greater part of the benzol is syphoned off. The rest is evaporated, without removing the wool plug, on the water-bath. When the benzol has been driven off alcohol (70 per cent.) is syphoned into the bomb. After macerating for a time the flasks are withdrawn by means of a sterilized forceps, and corked. After this maceration the gut regains its suppleness and elasticity, while its breaking strain remains the same before and after sterilization.—Pharm. Journ., June 3, 1905, 821: from Journ. Pharm. Chim. (6), *21* (1905), 496.

Sterilized Catgut—Formula Proposed for the "Codex."—Catgut is deprived of fat by means of ether, transferred to a strong glass vessel, which is filled with absolute alcohol and sealed by melting. The sealed vessel is then heated at 120° for 45 minutes and allowed to cool. When required for use, the catgut is removed from the vessel and heated for 15 minutes in sterilized water.—Pharm. Ztg., *49*, No. 69 (Aug. 27, 1904), 726; from Journ. de Pharm. et Chim., 1904, xx, No. 4.

Russet Shoe Paste—Formula.—Russet leather being of various shades, the paste or polishes for the same should require treatment accordingly. The following is for yellow:

Borax	40 parts.
Glycerin	20 parts.
Ammonia water	10 parts.
Shellac, orange	120 parts.
Aniline yellow (No. 690), water soluble	6 parts.
Water	1200 parts.

Bring 1,000 parts of the water to a boil, add the borax and dissolve; add, a little at a time, the aniline color, and dissolve. Keep the water in lively ebullition, add the shellac, a little at a time, and with constant stirring. Let boil for ten or fifteen minutes, pour off into a clean vessel, and let cool down. Mix the ammonia with the residual water, add it to the mass when quite cool, and stir well. Other shades (orange, light-brown, etc.) may be prepared in a similar manner, substituting other shades of water-soluble anilines, which is easily determined with a little practice. —Nat. Drug., Aug., 1904, 227.

Dressings for Russet Leather—Formulas.—The following formulas are given in the "Farben Zeitung," and are said to yield efficient dressings for russet leather that are once detersive and polishing, thus rendering the use of an extra liquid unnecessary:

1. Soft soap	2 parts.
Linseed oil	3 parts.
Annatto solution (in oil)	8 parts.
Beeswax	3 parts.
Turpentine	8 parts.
Water	8 parts.

Dissolve the soap in the water, and add the annatto; melt the wax in the oil and turpentine, and graudally stir in the soap solution, stirring until cold.

2. Palm oil	16 parts.
Common soap	48 parts.
Oleic acid	32 parts.
Glycerin	10 parts.
Tannic acid	1 part.

Melt the soap and palm oil together at a gentle heat, and add the oleic acid; dissolve the tannic acid in the glycerin, add to the hot soap and oil mixture, and stir until perfectly cold.

3. Oil turpentine	20 parts.
Yellow wax	9 parts.
Common soap	1 part.
Boiling water	20 parts.

Dissolve the wax in the oil with the aid of the water-bath, and the soap in the water, mix the two solutions in a hot mortar, and stir until cold.—Nat. Drugg., Jan., 1905. 17.

Sealing-Wax Insoluble in Alcohol—Formula.—The "National Druggist" (July, 1904, 194) prints the following formula for a sealing-wax that is not attacked by alcohol: Yellow beeswax, 5 parts; carnauba wax, 1 part; and paraffin, 1 part, are melted together, mixed with red lead, 5 parts, and prepared chalk, 2 parts, and the mixture heated, with constant stirring, until it thickens.

Colorless Varnish for Labels—Formula.—The "Drugg. Circular" gives the following formula for a colorless label varnish:

Mastic	8 parts.
Copaiba balsam	4 parts.
Venice turpentine	8 parts.
Oil of turpentine.	8 parts.
Sandarac	24 parts.
Alcohol	80 parts.

Mix and let stand in a closed vessel, until the oleoresins and resins are dissolved facilitating the process of solution by frequent agitation. To use the varnish to the best advantage and to obtain the brilliant, almost perfect surface it is capable of yielding, varnish the label first with collodion, giving it two coats, letting the first dry thoroughly before applying the second.—Drugg. Circ., Feb., 1905, 42.

MATERIA MEDICA.

A. Vegetable Drugs.

GENERAL SUBJECTS.

Burmese Drugs—An Interesting List.—David Hooper observes that the drugs of Burma, differing from those of the peninsula of India, have received very little special attention at the hands of investigators, and that since the annexation of Upper Burma in 1885, very few new drugs have been brought to light. Recently, however, a contribution has appeared in a paper on "The Vegetation of the Disirict of Minbu in Upper Burma," by Captain A. T. Gage, Curator of the Herbarium, Royal Botanic Gardens, Calcutta, which, being based on plants that were collected by a gentleman of the medical profession, and were critically identified as to their botanical origin, makes the list of some value. In addition to other interesting observations, this list, with the Burmese names and uses of the plants, is as follows:

Aerva javanica, Juss. ("On-bwe").—A paste of the root is used as an application in acne-like conditions of the face.

Ardisia humilis, Vabl. ("Shadwé").—All parts of the plant are used in the treatment of menstrual disorders.

Arundo donax, L.—Root used as a diuretic.

Buddleia asiatica, Lour.—A paste of the root is taken in rice water by the Chins as a tonic.

Capparis flavicans, Wall.—Leaves are used as a galactogogue.

Capparis hastigera, Hance ("Namanee-thanyet-gyi").—A paste of the root is used as an application to sores.

Chenopodium album, L. ("Myu").—A paste of the root used in treating the diarrhœa of children.

Chrozophora plicata, A. Juss. ("Gya-sagauk").—A decoction of the whole plant used in treating gonorrhœa.

Cissampelos pareira, L. ("Kywet-nabaung").—A paste is made from all parts of the plant and used as a local application in inflammatory conditions of the eye.

Croton oblongifolius, Roxb. ("Thetyin-gyi").—Leaves used in hot fomentations to allay inflammation, either strained in a cloth or first made into paste.

Dioscorea bulbifera, L. ("Khadu"—Used as a galactogogue.

Elephantopus scaber, L.—A decoction of the stem and leaves is used in menstrual disorders.

Euphorbia antiquorum, L. ("Teinganeik-tazaung").—The branches are sliced, dried and powdered, and administered to check profuse lochial discharge.

Heliotropium indicum, L. ("Hsin-hnamaung-bin").—A decoction of the whole plant used in treating gonorrhœa.

Leucæna glauca, Benth.—("Aseik-hpye-bin").—A paste of the leaves is appled for poisonous bites or stings.

Polygonum tomentosum, Willd. ("Wetkyien").—A decoction of the root is used in children's stomachic troubles.

Premna latifolia, Roxb. ("Seiknan-gyi").—A paste of the root is used as a local application after parturition.

Rosa involucrata, Roxb. ("Myit-king").—A decoction of the root is used as a mouth-wash in dental caries.

Sphæranthus indicus, L.—A decoction of the whole plant pounded down is employed as a tonic drink.

Sphæranthus peguensis, Kurz. ("Kodu-bin").—A paste of the leaves is used as a styptic, and in hot fomentations.

Streblus asper, Lour. ("On-hne-bin").—A decoction of dried leaves is administered in dysentery.

Ventilago calyculata, Tul. ("Thwe det").—A paste of the root is applied locally to excite granulation in wounds.

Viscum orientale, Willd. ("Kyibaung").—A paste of the powdered leaves is used as a local antiphlogistic.

Cattle medicines are represented in the three remaining drugs: A paste of the root of *Acacia farnesiana* ("Naulongyaing") is applied to the hoofs of cattle as a parasiticide, or as a preventive of the attacks of parasites. The plant, *Ocimum canum* ("Pin-zein") is used as a diuretic medicine for horses. A decoction of the plant, *Xanthium strumarium* ("Si-hne") is used as a tonic drink.—Pharm. Journ., Dec. 31, 1904, *956*.

West Australian Poisonous Plants—Identification.—E. M. Holmes calls attention to three specimens of plants supposed to be poisonous to cattle in West Australia, which were received for identification and proved to belong to the following species: (1) *Gasterolobium bidens*, Meissn.; (2) *Gasterolobium polystrychum*, Meissn.; and (3) *Mirbelia racemosa*, Turcz. In this connection Mr. Holmes gives an account of a number of other Australian "poison bushes," which are responsible for the loss of a large number of cattle annually in western Australia.—Pharm. Journ., Febr. 4, 1905, 141–142.

Plants Inducing Eczema—Enumeration.—J. H. Maiden contributes a paper on plants which induce eczema, in the hope that attention may be drawn to the subject and the active principles of the plants investigated. The list given by Maiden includes the well-known species of *Rhus*, viz., *R. radicans*, *R. toxicodendron*, *R. diversiloba*, *R. vernix*, the poison of which is destroyed by an alcoholic (50 to 75 per cent.) solution of lead acetate; *Primula obconica* and *P. sinensis*, *Hyacinthus orientalis*, *H. albulus*, and *Richardia ethiopica*. The active principle of *Primula* appears to reside in the glandular hairs; in the bulbous plants the minute raphides appear to be the source of irritation. In Germany the leaves of *Thuja douglasii* are reported to have caused, in one case, severe poisonous symptoms. Of Australian plants, *Phlebalium argenteum*, Sm., is known as the West Australian blister plant. *Dysoxylon richii*, C. DC., *D. muelleri* and *Castanospermum orientale* yield a wood, used for furniture, which causes severe inflammation of the mucous membrane in some persons, and two species of eucalyptus, viz., *E. maculata*, Hook., and *E. hemiphloia*, F. M., cause a kind of rash. The flowers of *Cassinia aculeata*, R. Br., give rise to a scaly eruption, and in one case in Australia the proximity even of *Pyrethrum parthenium* produced an eczematous swelling of the face. The acrid juice of *Excœcaria agallocha*, Linn., and *E. parviflora*, Mull. Arg., is also well known to produce considerable irritation, even temporary blindness, if it touches the eye.—Pharm. Journ., Aug. 6, 1904, 178; from Med. Press, *128*, 548.

Powdered Drugs—Analytical Scheme for their Microscopical Examination.—Burt E. Nelson's series of papers on an analytical scheme for the microscopical examination of powdered drugs, begun in Merck's Report of July, 1900 (see Proceedings, 1901, 652), and continued in monthly installments with few intermissions, is continued in the same journal during the past year, the microscopic features, illustrated by numerous drawings,

of the following drugs, being described since the date of the last report: LEAVES: *Camellia thea; Gaultheria procumbens; Barosma betulina*, and *B. crenulata* (Aug., 1904, 217–218). *Datura stramonium*. HERBS: *Mentha piperiba; M. viridis* (Sept., 1904, 252–253). *Melissa officinalis; Hedeoma pulegiodes* (Dec., 1904, 347–348). *Eupatorium perfoliatum; Artemesia absinthium; Tanacetum vulgare* (Febr., 1905, 37–38). *Grindelia robusta; G. squarosa* (March, 1905, 72). *Anemone pulsatilla; A. pratensis; Cytisus scoparius; Lobelia inflata* (April, 1905, 103–104). *Cannabis sativa (C. indica)*. FLOWERS: *Anthemis nobilis; Matricaria chamomilla* (May, 1905, 135). *Pyrethrum carneum; P. roseum; P. cinerariæfolium; Arnica montana; Calendula officinalis* (June, 1905, 166–168).

Edible Berries—Anatomy.—For the purpose of facilitating the microscopic examination of preserves, jams, etc., during the year 1901 and the early part of 1902, A. L. Winston made a study of the microscopic structure of a number of fruits grown in the United States, some of which are descendants of European species, others of species indigenous to America, and during the spring of 1902, while at the University of Graz, Austria, at the suggestion of Professor Josef Moeller, he extended the investigation to embrace the allied fruits grown only in Europe. The following twelve fruits were investigated in America: Cultivated strawberry (*Fragaria chiloensis*, Ehrh.); American field strawberry (*F. virginiana*, Duchesne); American red raspberry (*Rubus strigosus*, Michx.); black raspberry (*R. occidentalis*, L.); blackberry (*R. nigrobaccus*, var. *Sativus*, Bailey); dewberry (*R. villosus*, Ait.); red currant (*Ribes rubrum*, L.); black currant *R. nigrum*, L.); American gooseberry (*R. oxyacanthoides*, L.); European gooseberries (*R. grossularia*, L.); American cranberry (*Vaccinium macrocarpon*, Ait.); huckleberry (*Gaylussacia resinosa*, Torr. and Gray). The following three were studied in Austria: European raspberry (*Rubus idæus*, L.); forest strawberry (*Fragaria vesca*, L.); mountain cranberry (*Vaccinium vitis idæa*, L.). This paper is illustrated by numerous cuts exhibiting the macroscopic and microscopic structure of the several fruits described, and is reproduced from the original (printed in Ztschr. f. Unternch. d. Nahr. u. Genussm. (1902, *5*, 785–814) and reprinted in Connecticut Expt. Sta. Report, 1902, 288), in Amer. Journ. Pharm., September–November, 1904 (428–441 and 533–545), and January, 1905 (20–31).

ALGÆ.

Irish Moss—Collection on the Coast of Brittany.—Guégen gives the following interesting account of the collection of Irish moss on the coast of Brittany: It appears that this seaweed is regularly gathered in large quantities between Plougrescant and Perrosguirec, between May and August, chiefly by women and children, who wade in up to their waists at low tide and pluck the weed with the hands, or sometimes cut it with reap-

ing hooks. It is then roughly picked over, washed with fresh water, and spread out on the cliffs or meadows, the coloring matter being thus removed partly by washing and partly by bleaching. The weed when dried is then greenish-yellow in color; it is packed in sacks and sent chiefly to Hamburg.—Pharm. Journ., Dec. 31, 1904, 957; from Bull. des Sci. Pharm., *6*, 225.

BACILLARIÆ.

Bacillus Acidi Urici—Relation of its Fermentative Action on Chemical Constitution.—A striking instance of the intimate connection existing between the configuration of chemical substances and their susceptibility to fermentation is noted by C. Ulpiani and M. Cingolani. The *Bacillus acidi urici*, which has the property of decomposing uric acid into carbon dioxide and urea by a process of successive hydrolysis and oxidation, is without action on the closely-allied substances, *a*-methyluric acid, guanine, caffeine, and theobromine. On the other hand, the bacillus is capable of rapidly and completely oxidizing such acids as tartronic, malonic, and mesoxalic acids, which contain the same carbon chain as that constituting the central axis of uric acid, whilst, in addition, the ureides of these acids —namely, barbituric acid, dialuric acid, and alloxan—are converted by the ferment quantitatively into urea and carbon dioxide. Moreover, just as in the case of the sugars, only the hexoses are capable of undergoing fermentation, the bacillus of uric acid is indifferent to acids containing fewer or more than three carbon atoms.—Pharm. Journ., Mar. 11, 1905, 367; from Gazzetta, Jan. 14, 1905.

Bacillus Coli Communis—Bactericidal Action of Magnesium and Its Hydrated Oxide, which see under "Inorganic Chemistry."

Spirochæte Pallida—The Microbes of Syphilis.—In a communication to the Paris Academy of Medicine, it is stated that a "long-pale bacillus, refractory to staining agents and extremely evanescent," has been definitely observed by several different workers in a number of syphillitic patients. Its length is from 4 to 14 thousandths of a millimeter, while its breadth is about a quarter of a thousandth of a millimeter. The name of *Spirochæte pallida* has been given to the microbe. The bacillus has been discovered both in sufferers from the hereditary form of the disease and in inocculated monkeys.—Pharm. Journ., May 27, 1905, 789.

FUNGI.

Parasitic Fungi—Species Dangerous to Caoutchouc Culture.—P. Hennings has identified and given a detailed description of the following species of fungi observed on different species of *Hevea*, which under certain conditions may prove dangerous to caoutchouc culture: *Phyllachora Huberti*, P. Henn.; *Dothidella Ulei*, n. sp.; *Aposphæria Ulei*, n. sp.; *Ophiobolus Heveæ*, P. Henn., n. sp.; and *Parodiella melioloides*, Berk & C. The

author's original paper may be consulted in "Notizbl. d. Berl. botan. Gart., 1904, No. 34; Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 783.

Sclerotium Disease—Liability to Attack every Kind of Plant.—It is stated in "Board of Agriculture Leaflet" (127), that sclerotia-forming fungi do not confine their ravages to any particular plant, but attack almost every kind of plant. Cucumbers, turnips, carrots, beans, peas, and marrows suffer from their attacks, as do snowdrops, lillies and tulips. These fungi thrive also on decaying vegetable matter. Rotting of turnips and swedes and "yellow blight" of potatoes are examples of the injury due by this disease. The threads of the fungus pass along the inside of the stems of affected plants, and there form numerous solid masses, varying in size from that of a turnip seed to that of a grain of wheat. These masses, at first pale in color, eventually become black, and are called slerotia, in reference to their hardness; in the succeeding season they produce spores, which infect a new crop. The following treatment is recommended: (1) Collecting and burning all infected stems, leaves and bulbs is the only certain means of destroying the fungus; (2) accumulation of decaying vegetable matter act as nurseries for the growth and dissemination of the fungus, and should not be allowed in a garden; (3) gas-lime or quicklime should be applied to land where the disease has existed.—Pharm. Journ., Feb. 25, 1905, 2697.

LYCOPODIACEÆ.

Lycopodium—New Substitutes and Adulterants.—L. van Itallie adds two new lycopodium adulterants to those heretofore described—such as the pollen of various species of Pinus, mixtures of lycopodium, dextrin, talc and resin, etc. One of these new adulterants was finely-powdered amber, which was not easily distinguished in appearance from true lycopodium, though easily revealed under a lens. The second one consisted of finely powdered bast-substance.—Pharm. Ztg., *50*, No. 35 (May 3, 1915), 369; from Pharm. Weekbl., 1905, No. 9.

LICHENES.

Orseille—Present Botanical Source.—The name "orseille" is given in France, as is well known, to those lichens which, on exposure to air and ammonia, develop a purplish-red color. In a recent thesis, P. L. Bonceray enumerates the following lichens as being at present the chief botanical sources of this valuable dyestuff:

Roccella montagnei, which comes from Mozambique, Madagascar and Angola; and

Dendrographa leucophœa, Darb., which is imported from California, occasionally, under the name of "orseille des Colonies."

Usnea plicata, Fr. and *U. angulata*, Ach., are offered in the French markets; while

Lecanora glaucoma, Hoffm., and

Evernia prunastri, L., are also sources of orseille.

Regarding the constituents, these differ according to source and variety. "Erythrine" is the chief constituent of *Roccella montagnei* and *Dendrographa leucophæa;* "lecanoric acid" of *Roccella tinctoria;* and "orcine" of *Pertusaria dealbata;* but "orcine" occurs also in the three species first mentioned, although its presence appears to have been overlooked by previous observers. It can be detected *in situ* by the sulphovanillic reagent (made by mixing one part of concentrated sulphuric acid with one part of water and adding vanillin in excess—*i. e.*, to saturation), which reddens orcine, but not erythrine nor lecanorine. If made stronger with sulphuric acid, however, these are reddened also. The presence of other "chromogenous ether" is ascertained by soaking the lichen in water acidulated with one-fifth of hydrochloric acid for half an hour, to remove calcium oxalate, and then, after washing with distilled water, taking a section and treating it with a solution of 1 part of calcium hypochlorite in 40 parts of water under the microscope, when a red coloration indicates their presence. For a detailed description of the constituents of the different lichens, the original thesis must be referred to, which is given in abstract in Pharm. Journ., Nov. 19, 1904, 734.

GRAMINACEÆ.

Kapok Fibre—Characters and Possible Use in Medicine.—Attention is directed in "Journ. de Med. et de Chirurg.," to a fibre derived from a certain species of bamboo, and designated as "kapok fibre." It is an extremely light cotton which appears, surrounding the seeds, at the dehiscence of the capsule. Its filaments are rusty-white in color and are very difficult to wet in water, so that they float and do not sensibly increase in weight, even after immersion for several months. It is stated that 300 Gm. of kapok fibre is sufficient to sustain a man of ordinary weight on the surface of the water. It is chiefly for life-saving and similar applications that it has hitherto been used. It is suggested that it may find valuable application in medicine in place of ordinary cotton for various purposes where a non-absorbent, unwettable fibre is required, both to prevent wetting from wound drainage and from exterior applications. When nitrated, as in preparing the official pyroxylin, kapok develops a blood-red color, and the fibres, after washing, remain yellow. They are only partially soluble in the ether-alcohol solvent. The solution applied to the skin, leaves a thin, yellow, adherent pellicle.—Pharm. Journ., Oct. 29, 1904, 609 ;from Journ. Pharm. Chim. [6], *20*, 313.

Lolium Temulentum, L.—*Histology of the Fruits.*—J. R. Erdélyi, in view of the attention attracted by the poisonous properties of the fruits of *Lolium temulentum*, considered it of interest to examine lolium fruits from different countries, soils, and climates in order to ascertain whether the

fungus was always present, aud whether, therefore, its presence was to be considered a case of symbiosis. At the same time it was desirable to ascertain whether the fungus could be found in the fruits of other species of *Lolium*, as very varying opinions have been expressed on this point. It was found, after careful investigation, that the fruits of *L. temulentum*, with very few exceptions, always contained the fungus, no matter from what country they were procured. It can be seen in transverse sections of the fruits, but can be made more readily discernable by clearing the sections with warm chloral hydrate, washing first with it, and then with dilute acetic acid, staining for ten to fifteen minutes in Ziehl's carbolized fuchsin slightly warmed, and finally washing out with dilute acetic acid. The aleurone layer is colored dark-red, while the fungus, which lies between this and the hyaline layer, acquires a brighter red color. The fungus was also found in the fruits of *L. perenna, L. arvense*, and *L. italicum*, but in the last-named species comparatively few of the fruits contain it. Details of the anatomy of the various fruits examined are given in the original.—Pharm. Journ., Jan. 21, 1905, 75; from Ztschr. d. Œster. Apoth. Ver., *42*, 1365.

Malt—Stimulating Effect of Formaldehyde.—Somlo and von Laszloffy record some interesting observations concerning the action of formaldehyde on malt. Green malt was steeped for a short time in solutions of formaldehyde and the diastatic power determined. In all cases the formaldehyde was found to have had a remarkable stimulating influence on the diastatic power of the malt. The addition of formaldehyde produced no increase in the diastatic powers of malt extracts. The reason for this influence is unexplained.—Pharm. Journ., April 1, 1905, 484; from Oesterr. Chem. Ztz., through Brewers' Journ., *40* (1904), 735.

Citronella and Lemongrass—Andropogon Species Yielding the Ceylon Oils.—Ch. J. Sawer contributes a highly interesting paper, illustrated by numerous cuts showing the principle characters of distinction at different stages of their growth of the species of *Andropogon* yielding citronella and lemongrass oil, respectively, in Ceylon. There are two forms of citronella grass in Ceylon—the wild and the cultivated; the former is called "maana grass" of the *patanas*—the latter being an immense tract of uncultivated land in the interior of the island. This plant is the *Andropogon nardus*, Lin., var. *d-nilagiricus*, Hackel. The other form of citronella is only known in Ceylon in the cultivated state, and is locally called "Pangiri Maana." It is the *Andropogon nardus*, sub-species *genuinses* of Hackel, referred to by Hooker fil. ("Flor. Biit. Ind.") as *forma culta*, and now identified by Forbes and Hemsley as synonymous with the *Cymbopogan nardus* of Rendle, cultivated in some parts of tropical Asia, as at Hong-Kong, and of which there is a specimen in the British Museum Herbarium. Consequently it may be inferred that this is the plant intended to be figured in Bentley and Trimen's "Medicinal Plants," although the plates in that work are not, in the opinion of some botanists, specimens of the

best botanical drawing and coloration. The description of this plant given by Bentley and Trimen may, however, be accepted as authentic. The forms of *A. nardus* met with in the Straits Settlement and Java require verification from fresh material. The lemongrass cultivated in Ceylon for the distillation of oil is apparently the *Andropogon citratus* of De Candolle, which has been figured and described under various designations. It is a native of Bengal, and is cultivated more or less all over India.—Chem. & Drugg., July 30, 1904, 179–182.

LILIACEÆ.

Aloes—Saccharine Derivative.—It has previously been shown by E. Léger that the aloins, when treated with sodium dioxide, are split up into methylisochrysasin and a sugar which it has not been possible heretofore to isolate for identification. He had noticed, however, as had also been noticed by E. Hirschsohn, that alcoholic solutions of

Barbaloin and *Iso-Barbaloin*, when kept for a long time, gradually lose their bitterness, and he has now succeeded in isolating this sugar of an aloes, which he has named

Aloinose, by diluting such tasteless (bitterless) alcoholic solutions with water, filtering from insoluble matter, decolorizing with animal charcoal, and evaporating at a temperature below 70° C. or over sulphuric acid. The pale yellow syrup thus obtained gives a crystalline osazone with phenylhydrazine acid, which forms yellow lamellæ in rosettes. The syrup, when heated with dilute sulphuric acid, gives off vapors which redden aniline acetate paper. A minute quantity heated with strong hydrochloric acid and orcin gives at first a red, then a green color. On boiling, a dirty green precipitate is formed, which is soluble when cold in ether, giving a fine persistent green solution.—Pharm. Journ., Oct. 8, 1904, 505; from Jour. de Pharm. et Chim. (*6*), *20*, 145.

Aloes—Method of Valuation and Distinction.—In 1900 Tschirch and Hiepe described a general method for the valuation of purgative drugs, which was based upon the separation and identification of the *free* oxymethylanthraquinones (emodins) contained in them (see under Senna, Proceedings, 1901, 733). In a highly interesting paper, Tschirch and Hofbauer now communicate the results of their researches undertaken to ascertain the most reliable method for the valuation and distinction of the various sorts of aloes. They find that the method proposed in 1900 is not applicable for this purpose, because the bulk of the important purgative constituents of aloes—aloin and substances that yield oxymethylanthraquinone (aloe-emodin) by hydrolytic or oxidizing processes—would escape detection; for the method determines only the *free* aloe-emodin present in the drug. The important points determined in the present researches are summed up by the fact that the percentage of resin contained in the sample establishes the purgative value inversely to its proportion; the

sample containing the largest amount of resin possessing the most inferior purgative efficiency. The valuation of aloes may, therefore, be simplified by the quantitative elimination of the resin, depending on the solubility of the active components—aloin, aloe-emodin, and bodies yielding the latter by hydrolysis, etc.—and the insolubility of the resin in chloroform, the process being carried out as follows: 5 Gm. of aloes are macerated with 5 Cc. of methyl alcohol, in a 50 Cc. flask, for 12 hours, then heated to 50°–60° C., vigorously shaken with 30 Cc. of chloroform gradually added, and set aside. After subsidence of the more or less smeary resin, the supernatant, yellow chloroform solution is filtered into a tared Erlenmeyer flask, the chloroform is distilled off, and returned to the resin, which is again shaken with it, and treated as before—this treatment being repeated four times more in order to secure the complete extraction of the resin. The accumulated residues remaining from the distillation of the chloroform solutions are then dried at 100° C. to constant weight, and by difference the weight of undissolved resin is ascertained and calculated in percentage. The light-yellow residue from the chloroform solutions will yield crystalline aloin readily by recrystallization from dilute alcohol or from chloroform methyl alcohol. It may be estimated quantitatively with practical accuracy by Schonteten's colorometric reaction, depending on the intense greenish fluorescence produced by aloin in concentrated borax solutions, while the quantity of anthraquinone derivatives is determined by a method based upon their conversion into chrysamic acid. Both of these methods are described in detail, but must be consulted in the original. The results by the proposed method of valuation, as applied to different sorts of aloes, are exhibited in the following table:

Variety of Aloes.	Aloin.	Other substances yielding chrysamic acid.	Substances soluble in chloroform and methyl alcohyl, *not* yielding chrysamic acid.	Resin.
Cape Aloes (soft)	20%	55%	11.8%	13.2%
Cape Aloes (dry).....	16%	59%	6.2%	18.8%
Uganda Aloes.....	16%	34%	30.4%	19.6%
Barbadoes Aloes(new process)	18%	32%	22.4%	27.6%
Barbadoes Aloes (old process)	16%	34%	12.8%	37.2%
Curacao Aloes.....	18%	32%	16.6%	33.4%
Socotrine Aloes	8%	25%	3.6%	63.4%

These results point out the important and noteworthy fact that all the

commercial sorts of Cape Aloes contain the largest proportion of active constituents, and that Socotrine Aloes, to which preference has been given on the ground of superior efficiency, is in reality the sort containing the smallest quantities. The authors, in conclusion, recommend the following qualitative tests for distinguishing Cape Aloes from the other sorts:

I. *Cape Aloes.*—The aqueous solution, 1 : 1000, shows a green fluorescence after addition of 5 per cent. of powdered borax.

II. *Aloe-Emodin.*—10 Cc. of the aqueous solution, 1 : 1000, are shaken with 10 Cc. of benzol for one minute, and the decanted benzol shaken with 5 Cc. of ammonia water, which should assume a rose color.

III. *Absence of Ito-aloin* (Distinction from Barbadoes Aloes). 10 Cc. of the aqueous aloes solution, 1 : 1000, treated with a drop of solution of cupric sulphate, 1 : 20, assume an intense yellow color, changing to red on addition of a trace of sodium chloride and a few drops of alcohol.

IV. *Absence of Nataloin* (Distinction from Natal Aloes). If the yellow solution, obtained by mixing a small quantity of aloes and concentrated H_2SO_4, is distributed over a porcelain surface and exposed to a trace of fuming nitric acid, the solution should not turn green.

V. *Anthraquinone Substances* (Formation of Chrysamic Acid). 1 Gm. of aloes is mixed in a porcelain dish with 20 Cc. of concentrated nitric acid, the mixture heated on a water-bath during two hours, replacing the evaporated nitric acid, then continued to dryness. The residue, when mixed with water, leaves a brown powder, which is soluble in ammoniacal water with a violet-red color.—Schweiz. Wschr. f. Chem. u. Pharm., *43*, No. 12 (Mar. 25, 1905), 153.

Aloes—Simple Test for Determining the Sort in Compound Rhubarb Pills.—T. Fawssett has devised and recommends the following simple test for ascertaining the kind of aloes in compound rhubarb pills, which, according to the B. P., should be made with Socotrine aloes:

Remove the coating and rub the pill itself to fine powder (drying if necessary). Of this take 3 grains, mix it thoroughly with ½ grain of powdered potassium ferricyanide ($K_6Fe_2C_{12}N_{12}$), and of the mixture place a quantity about equal in size to a coriander fruit upon a microscopic slip; add enough distilled water to form a thin paste, which spread out into a spot about ¾ inch in diameter and allow it to dry thoroughly. Upon examining this spot under the microscope by transmitted lamplight, using a low power, the aloes in the pill will be found to present the following appearances:

Socotrine.—Rounded pieces of a yellow color (sometimes brown or green); often looking somewhat like potatoes.

Barbados.—Rounded pieces of a decidedly red color, and similar in shape to Socotrine. This kind of aloes stains the ferricyanide red beyond the margin of the aloes itself.

Cape.—Irregularly shaped *glassy* pieces of a pale green color.

These three kinds are probably those most likely to be used in pill-making, but the following color reactions with ferricyanide may be observed with some varieties of aloes not in such general demand, viz.: *Curaçao "Livery,"* greenish-brown; *Curaçao "Capey,"* greenish-brown, turning slowly crimson; *Natal,* pale greenish-brown; *Zanzibar,* pale brown. If the still moist spots of the above experiments have the vapor of ammonia passed over them, "Livery" Curaçao, Natal, Zanzibar, Socotrine, and Cape, all change to various shades of brown, but Barbados and "Capey" Curaçao turn purple.—Pharm. Journ., Sept. 10, 1904, 401.

"Death Camas"—Alkaloidal Constituents.—Henry B. Slade has obtained from the bulbs of

Zygadernus venomosus, the "death camas," long known as a powerful drug and called "Wa-i-mas" by the Nez Perce Indians, a number of alkaloids, which has been identified to be *sabadine, sabadinine,* and *veratalbine.* The experiments, which are given in some detail, were undertaken at the request of Prof. V. K. Chesnut, who had previously isolated a veratrine-like alkaloid from the leaves of the same plant while in charge of the investigation of poisonous plants in the U. S. Department of Agriculture. It seems probable that the three alkaloids now obtained are derived from protoveratrine. The veratalbine is the main constituent of the alkaloidal mixture obtained.—Amer. Journ. Pharm., June, 1905, 262–264.

Sanseviera Thyrsiflora—Constituents of the Rhizome.—In a preliminary notice on the constituents of the rhizome of *Sanseviera thyrsiflora,* a South African plant used successfully by the Boers as a remedy for piles—the peeled rhizome being simply chewed. Frederick Davis states that he has discovered a glucoside, a globulin, and an albumin in the rhizome, and that the fresh rhizome is active, and the dried almost inactive. He therefore suggests that for prescribing purposes the juice of the fresh rhizome, preserved by the addition of 20 per cent. of glycerin, should be employed. Ethylic alcohol impairs the therapeutic action of the juice. The plant is known in Africa as "Sikolakota," and by the Kaffirs as "Isi Kolakota."—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 575–576.

IRIDEÆ.

Saffron—Cultivation in Lebanon County, Pennsylvania.—Joseph L. Lemberger contributes an extremely interesting paper on the cultivation of saffron in Lebanon county, Pa., in which he incidentally gives a very thorough historical description concerning the uses of this drug, which is even mentioned among the fragrant substances in Holy Writ. The culture of saffron in the Pennsylvania German counties, especially Lebanon, Lancaster and Berks, has been regarded during the past century as one of the most profitable garden crops. It was the one product that was, at least, worth its weight in silver, and to this day the author does not purchase the

home product in any other way. Saffron is placed on one scale pan and silver upon the other, and "what it draws"—in local parlance—the seller receives. The cultivation of saffron is, however, declining in Lebanon county; it is fast dying out with the generation of the Pennsylvania German housewives now passing. The girls growing up to take their places, prefer attending garden crops not requiring the tedious care that saffron does. The author describes the method of cultivation as witnessed by him; the uses made of the saffron by the housekeeper in the Pennsylvania German counties; the custom and superstition that go hand-in-hand with saffron culture, and other matters of more or less local interest that will be read with advantage in the original paper, in Amer. Journ. Pharm., May, 1905, 209–213.

Saffron—Method of Ash Determination.—Caesar and Loretz call attention to the necessity of ash determinations in examinations of saffron. A recent ash determination, in a sample of saffron of exceptionally brilliant color and satisfactory general appearance, was found to yield 35.93 per cent. of ash, whereas numerous determinations of pure natural saffron of the current crop gave only from 3.70 to 4.40 per cent. The method employed, which is recommended by G. Fromme as furnishing reliable results, consists in introducing 0.5 to 1.0 Gm. of the sample, previously cut up, into a tared crucible with 2 Gm. of pure calcined sand, ascertaining the content of water by drying at 100° C. in a drying-oven, and, having carefully mixed the saffron with the sand by the aid of a glass rod, incinerating it in the crucible to ash with the addition, if necessary, of a little fuming nitric acid, followed by oxalic acid, and weighing. The weighting of saffron has in recent years become a common practice, and when skillfully carried out detracts nothing from the appearance of the original sample, as is evident from the examination of the sample above-mentioned, which had been weighted with Glauber's Salt, and could only be distinguished from good natural saffron by its brittleness and feeling hard to the touch.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

Saffron—Quality of Commercial Samples.—Willard Graham determined the ash and moisture in seven samples of Spanish saffron. The ash found was 4, 4.8, 4.9, 4.8 and 4.8 per cent., the moisture, in the same order, 8.5, 8.9, 10.5, 9.6 and 10.1 per cent. respectively. These figures are well within the U. S. P. requirement, but the fourth sample contained more yellow stems than usual.—Proc. Penna. Phar. Assoc., 1904, 130.

Saffron—Adulteration in Spain.—H. John Henderson calls attention to a recent importation of saffron, in hermetically sealed tins, from Spain, which is well calculated to deceive those who neglect to apply the tests of the Pharmacopœia. It presents the appearance of a particularly handsome-looking specimen, and a close scrutiny will fail to detect that it has been loaded in any way. On exposure to air it absorbs moisture to a

much greater degree than ordinary saffron exposed under similar conditions. When floated in warm water it does not deposit any insoluble powder. This saffron contains 17 per cent. of moisture and 25 per cent. of ash. The ash is readily fusible, and consists principally of a soluble salt of potassium.—Chem. & Drugg., Nov. 19, 1904, 833.

Saffron—Difficulty to Determine Adulteration with Sugar.—A. Nestler states that pure saffron, in course of time, becomes covered with a fine greyish efflorescence, which, when examined under the microscope in olive oil, is seen to consist of irregular crystals; this substance appears to be sugar, of which saffron contains some 14 per cent. Such efflorescences have been observed by Vogl and Hanausek. If powdered sugar be dusted on saffron and allowed to stand, a similar efflorescence is produced, but in this case the crystals are well defined. Such fraudulent addition of sugar can easily be made to a considerable extent, and the addition cannot be satisfactorily determined by chemical means.—Pharm. Journ., May 27, 1905, 789; from Ztschr. f. Unters. Nahr. u. Genussm., *9*, 337.

ZINGIBERACEÆ.

Jamaica Ginger—Cultivation.—According to Cook and Collins the ginger plant cultivated in Jamaica grows to about 5 feet high and flowers freely, whilst that grown in Liberia rarely reaches more than 2 feet, and seldom flowers. There are two forms of the Jamaica plant alike in the aerial portions, but having rhizomes of a flinty or yellowish-white in the one and a bluish tint in the other, as seen when freshly gathered; but this appearance is lost in drying. The blue-colored rhizome is considered inferior in aroma. The plant is usually grown chiefly by small cultivators at an altitude of 2,000 feet, where the rainfall is tolerably constant. As the crop is a very exhaustive one, fresh ground has often to be resorted to. The plantations are made in March and April. The extremities of the rhizome or ratoons bearing the terminal bud are placed in furrows at a depth of 50 to 75 Mm. at a distance of 30 to 45 Cm. It is not necessary to afford shade, but it is necessary to weed carefully. The soil should not be disturbed when the plants have reached a certain height. The flowering takes place in September and the rhizomes are collected from December to March; they are not removed until the aerial part has been withered, but may thereafter be collected at any convenient time provided they show no new foliage. The rhizomes when dug up are cleaned, scraped and washed, and laid out to dry, a process which is complete in about eight or ten days in the case of scraped rhizomes, whilst those not scraped require three weeks or more, and become inferior in aroma.—Pharm. Journ., Nov. 26, 1904, 774; from Journ. d'Agric. Trop., *4*, 181.

Turmeric—Analyses of Three Commercial Sorts.—Albert E. Leach communicates the following results of analyses made in his laboratory of

three varieties of turmeric commonly used in this country, the samples being ground in each case from large fragments of the rootstock:

Variety.	Moisture.	Total Ash.	Ash Soluble in Water.	Ash Insoluble in Hydrochloric Acid.	Total Nitrogen.	Protein N x 6.25.	Total Ether Extract.	Volatile Ether Extract.	Non-Volatile Ether Extract.	Alcohol Extract.	Crude Fibre.	Reducing Matters by Acid Conversion of Starch.	Starch by Diastase Method.
China....	9.03	6.72	5.20	0.11	1.73	10.81	10.86	2.01	8.84	9.22	4.45	48.69	40.05
Pubna ...	9.08	8.52	6.14	—	0.97	6.06	12.01	4.42	7.60	7.28	5.84	50.08	29.56
Alleppi ..	8.07	5.99	4.74	—	1.56	9.75	10.66	3.16	7.51	4.37	5.83	50.44	33.03
Average..	8.73	7.07	5.36	—	1.42	8.88	11.17	3.19	7.98	6.96	5.37	49.73	34.21

—Journ. Amer. Chem. Soc., 1904, *10*, 1210.

ORCHIDEÆ.

Vanilla—Cultivation on Réunion.—De Cordemoy reports on the experience of the Réunion vanilla planters with regard to the supports used for training the vanilla plant. According to the author, wooden or metal poles have been entirely discarded there, and in the course of time the planters have adopted the use of trees as natural supports for the vanilla. The kinds which come especially under consideration are *Casuarina equisetifolia* Forst., called "filao," and further, *Jatropha curcas* L. and *Pandanus utilis* Bory. The "filao" soon came out of use, as during the growth its bark peeled off and the vanilla shoots lost their support. The experience with the *Jatropha* was favorable, but in the case of heavy shoots it was found too feeble and had to be supported by poles. The most satisfactory was the *Pandanus*, which through its numerous adventive roots offers a sufficient resistance to the cyclones which occur so frequently in Réunion. It is usual to plant the vanilla cuttings close to the roots of a *Pandanus*, when the shoots very rapidly twine themselves round the roots and trunk. This method appears to be the one generally employed. Very remarkable is the occurrence of a microscopic fungus between the aerial root and bark of the living support, whose mycelian filaments penetrate not only the root-bark of the vanilla, but also the bark of the supporting tree, and, according to de Cordemoy, are important for the nutrition of the vanilla plant.—Schimmel's Rep., Oct.–Nov., 1904, 138; from Journ. d'Agricult. trop., *4* (1904), 104.

SANTALACEÆ.

Sandalwood—Varieties and Cultivation in German Africa.—In a communication from the Biologico-Agricultural Institute, Amani (German

Africa), A. Zimmermann gives a review of all trees supplying wood designated as sandalwood, of which many are in no way related to *Santalum album* L. Some interesting information is also given on the most important one, the

East Indian Sandalwood Tree, the cultivation of which should first of all be taken into account for the German colony. As the genuine sandal tree, which has hitherto only been cultivated in East India and Java, belongs to the root-parasites, this fact should not be lost sight of when laying out plantations. The parasitical mode of life commences already a few months after germination, when the rootlets of *Santalum album* L. drive real haustoria first of all into the roots of grasses, herbs and small shrubs, subsequently also into those of trees. For this reason the young plants are suitably planted out each along with another young plant in baskets made from the sheaths of bamboo leaves, and are later on best cultivated in mixed stocks. The most advantageous time for the harvest is in the 27th to 30th year, when the trees are felled and the thicker roots dug out. The wood is barked, split up and sorted, when special regard should be paid to the color, as the oil content of the wood as a rule is all the larger, the darker the color is.—Schimmel's Rep., Oct.–Nov., 1904, 84.

LAURACEÆ.

Californian Camphor Trees—Description.—E. M. Kimberlin calls attention to the camphor trees found near Lake Shabot in the hills back of the town of Berkeley, in Alameda County, Cal., where they appear to be indigenous. Most of the trees range from 20 to 25 years of age, this being ascertained by counting the rings from the bark to the centre of the tree. These trees resemble the characters of the genus *Cinnamomum camphora*, from which the official camphor is obtained. They are about 25 feet high, much branched: bark smooth; green leaves that are wide, narrowing toward both ends and of a thick structure. The bark when freshly cut has the odor of sassafras; this is of importance, as the camphor, cinnamon and sassafras trees have been separated from the proper laurels by Ness and made the types of distinct genera, which have been adopted by most recent writers and may be considered as well established. The trees grow in a dark dobby-like soil. The trunk of the tree drawn from the surface is cone-shaped, having many roots and rhizomes, extending from the trunk, and the tree is well nourished in this way. The leaves have, when bruised, the odor of camphor, which is diffused through all parts of the plant. The leaves and small branches of one of these trees were subjected to steam distillation, applying moderate heat. The leaves were found to contain about 0.15 per cent. camphor and of a very pure quality; in fact, more pure than that from where the largest supply comes —viz., Japan and China—where the camphor obtained is in the crude state, and has many impurities. The camphor of the wood was found to be

obtainable only by sublimation with a high heat, and the camphor thus obtained from the wood was found to be not so pure as that obtained from the leaves and the branches by distillation. Of late years it has been thought possible that a profitable industry might be inaugurated in this country by extracting camphor for commercial purposes, and many thousands of plants have been propagated in the green-houses and distributed in districts where the climate is suited to their growth. An average of 6,000 plants has been the yearly output for five or six years, with the hope that the question of profit would be tested. However, the best mode of procuring the camphor has yet to be decided, whether from the leaves, twigs, wood or roots; also the best season of the year, the best methods of distillation, and other points which enter into the economics of the industry. —Amer. Drugg., June 12, 1905, 315.

Camphor Trees—Cultivation Experiments in the German Colonies.—The monopoly held by Japan in the production of camphor and camphor oil has led to experiments in the cultivation of the camphor tree in various tropical and sub-tropical regions. A commencement has now also been made in the German African colonies with the cultivation of *Cinnamomun camphora* Nees and Eberm., as is reported in communications from the Biologico-Agricultural Institute at Amani. The camphor trees are best grown from seed, which is gathered in Japan in the autumn, and which after being dried is kept during the winter in white sand. According to Bamber and Willis, the seed, before sowing out, is soaked in a suitable manner for 24 to 48 hours in water, and then sown at a depth of ½ to ¾ inch. When the plants have attained a height of 10 to 16 inches they can be planted out for good. The space between the plants varies, according to whether it is desired to obtain the camphor from the leaves or from the wood of the trees; in the former case it may be convenient to plant in the form of hedges, but in the latter to leave more room between the plants—say 15 or 16 feet in every direction. The camphor tree can be propagated not only from seed, but also by layers and shoots. Experiments in this direction will also be made by the Biologico-Agricultural Institute. Of *Dryobalanops aromatica* Gärtn, which yields the Borneo camphor, there are up to the present only a few young plants in the experimental garden at Amani. As soon as an opportunity presents itself, cultivation experiments will be made on a larger scale. According to the information from Amani it is, however, not considered advisable to plant the composite *Blumea balsamifera* D. C. (which yields the Blumea camphor) in the German Colony.—Schimmel's Rep., Oct.–Nov., 1904, 15.

Wild Cinnamon—A New Drug.—E. M. Holmes mentions that under the name of "Wild Cinnamon" a number of bales of a bark have been offered in the London market. This bark is in quilled pieces, 3 to 7 Cm. wide, 3 to 5 Mm. thick, and 15 to 30 Cm. long, and is referred by Dr. Symes to

Cinnamomum pedatinervum Meisn., a tree indigenous to Fiji. It is described in Seemann's "Fl. Vitiensis," p. 202, and illustrated in pl. xlviii. He states that the bark is used by the natives for scenting cocoanut oil, and in Namosi as a sudorific. It is called "Mon" in the Kadava dialect, "Main" in that of Namosi, and "Macou" in that of Bau. The last name has a curious resemblance to that of Massoi, an aromatic Monimiaceous bark of New Guinea. "Museum Report," 1903, p. 56. The volatile oil has been distilled, and is described under "Organic Chemistry."—Pharm. Journ., Dec. 17, 1904, 892.

Annam Cinnamon—A Valuable Sort.—E. Perrot gives some highly interesting information concerning the cultivation and trade of cinnamon in Annam, where the trade is monopolized by the Chinese, and it forms an important export article to Hongkong. It is not derived, as has heretofore been believed, from *Cinnamomum culilawan*, but from *C. loureiri*, Nees., although it is not beyond controversy that other species may contribute to the trade supply. The value of Annam cinnamon in China is so high that it brings a much higher price before export than does Ceylon cinnamon in the European market. Indeed, the cinnamon from Tan-hoa, which is reserved for the Court of Annam, and occasionally reaches the market, is sold at prices from 15 to 20 times that of the above-mentioned. The barks, which are partly derived from wild, and largely from cultivated plants, are harvested essentially like the Chinese cinnamon. The quilling of the bark is, however, prevented, being pressed into flat pieces and supplied in small bundles, and represented in several grades: (1) *Stem-bark*, "Quê-Kep," the best sort; (2) *branch-bark*, "Quê-Kien," a less valued sort; and (3) *twig-bark*, "Quê-thanh," the least valued. The centre of trade in this bark is Tra-my, a small village in Söng-Tangtai. The entire crop is exported to China.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 498; from Bull. des sc. pharm., 1905, 242.

Tetranthera Polyantha var. Citrata—Volatile Oils of the Bark and Leaves.—Schimmel & Co. have had opportunity to distill the volatile oils separately from the leaves and bark of *Tetranthera polyantha var. citrata*, Nees, a tree known in Java by the name "Ki lemolo." These oils had a pleasant aroma, and were constituted as follows:

Oil from the bark (yield of oil 0.81 per cent.). The lemon-yellow oil has a specific gravity of 0.8904, and a rotation a_D of + 10° 11′; it dissolves in about 1 and more vol. 80 per cent. alcohol. A test showed that the oil contains aldehydes, probably a mixture of citral and citronellal (melting-point of the naphthocinchoninic acid 220° to 225°).

Oil from the leaves (yield of oil 5.42 per cent.): bright-yellow; d_{15} 0.9042; a_D — 15° 41′; soluble in 2.5 to 3 and more vol. 70 per cent. alcohol. Contrary to the bark oil, the leaf oil appears to contain only citral (melting-point of the naphthocinchoninic acid 198° to 200°), whose quantity amounts to about 30 per cent.; in the non-aldehydic portions

cineol was detected (melting-point of the iodol-compound 111° C.).—Schimmel's Rep., April–May, 1905, 85.

MYRISTICACEÆ.

Nutmegs—Cultivation in Java.—In a long treatise on the cultivation of the nutmeg trees in Djati Roengge (Java), Gillavry mentions that on his arrival in 1876 he only found a 45-year-old plantation of 180 nutmeg trees, which to-day are still in existence and bear fruit. In the following year 5,000 Banda nuts were planted, and the plants obtained from these seeds transplanted only in 1879, when they were about 18 inches high and possessed a sufficiently developed root-system. Of this seed about 3,000 plants flourished well, and about 50 per cent. carried male blossoms. In 1886 the author started a nursery, in which the fruit of the best trees of the old plantation was planted out. Although the fruit was small, it was used with advantage, as only 35 per cent. male trees were produced from it. The seed rapidly loses its germinative power, and it is therefore necessary to plant it soon; boxes with moist sand are used for transport. A month after sowing out the seed germinates, producing in the first instance a tap-root without ramifications. The young plants must not be taken up until after 18 months, and then only together with a sufficiently large lump of soil. If no favorable site is available for such cultivation it is advisable to arrange the seed-beds in plaited baskets. The plants should grow in a shady place until the trees have developed a sufficient number of branches to shade the soil themselves. The nutmeg tree is cultivated successfully at altitudes of from 750 to 2,000 feet. The preparation of the crop is very simple. The fruit-pods and mace are removed from the seed, washed in salt water, and dried as quickly as possible in the sun or in a drying cupboard. The nuts from which the pods have been removed are rolled in slaked lime and packed in cases which have been given a lime-wash on the inside.

The cultivation of the nutmeg tree may be recommended as a by-cultivation, as it does not require much care nor much manure. While the tree will bear fruit from the seventh year, the crop is not good until the twelfth year, and then improves from year to year.—Schimmel's Rep., Oct.–Nov., 1904, 66.

Mace—Sugar a Natural Constituent.—According to the researches of Ludwig and Haupt, mace contains a dextrogyre sugar, soluble in cold water, as a normal constituent. Calculated as glucose, banda mace yielded from 2.8 to 4.28 per cent.; menado mace, 2.19 per cent.; Papua mace, 1.65 per cent., and Bombay mace, 2.84 per cent. of sugar. This observation is important, since adulterations of mace with sugar have in recent years been frequently reported.—Pharm. Ztg., *50*, No. 19 (Mar. 8, 1904), 198; from Ztschr. f. Unters. d. Nahrungsm., 1905, No. 4.

Rhubarb—Colorimetric Valuation.—Tschirch recommends a method for the valuation of rhubarb, which is based upon the volumetric estimation of the free

Oxymethylanthraquinones and dependent upon the ease with which the anthraglucosides present are hydrolized with sulphuric acid under formation of these bodies. The oxymethylanthraquinones can then be shaken out quantitatively with ether, and from their ethereal solutions are shaken out by very dilute potassium hydrate solution, forming cherry-red solutions in which the oxymethylanthraquinone content is estimated by comparison with a standard solution of aloe-emodin in water containing a trace of potassium hydrate. Under this test, good sorts of rhubarb afford a pure red solution, inferior sorts a yellowish-red color. The valuation is carried out as follows: 0.5 Gm. of the finely powdered rhubarb and 50 Cc. of 5 per cent. of sulphuric acid are boiled for 15 minutes under a reflux condenser; the mixture is allowed to cool and, without previous filtration, shaken out repeatedly with 50 Cc. of ether, until the ether remains colorless and does not produce a red color when added to dilute potassium hydrate. The residual aqueous rhubarb mixture is then, after evaporation of dissolved ether, again boiled for 15 minutes, and shaken out with ether as before. The united ether extractions are now shaken out with several portions of 200 Cc. of water containg 5 per cent. KOH, as long as a red color is communicated to the alkaline water, and the united alkaline solution brought to the volume of 500 Cc. Of this red solution, 100 Cc. are diluted with water to 1 liter, and 350 Cc. of this dilution are again diluted to 1 liter. If the liter-flask containing the last dilution is then placed on white paper, it should exhibit a distinct cherry-red color, of at least equal depth as that of an alkaline solution of aloe-emodin containing 1 : 1,000,000. In this way it is possible to recognize all good sorts of rhubarb, containing from 2.8 to 4.0 per cent. of oxymethylanthraquinones. Distilled water must be used throughout in carrying out this test, since the oxymethylanthraquinones are precipitated by calcium salts that may be present.—Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 651; from Südd. Apotheker-Zeitung.

Rhapontic Rhubarb—Detection in Powdered Rhubarb.—Rhapontic rhubarb (Rad Rhei Austriaci) is characterized by containing a magnificently crystalline, colorless glucoside, rhaponticin ($C_{21}H_{24}O_9$), which is present in the roots to the amount of about 1.42 per cent. It is quite insoluble in ether, so much so, that it will separate from an extraction of this if shaken with ether. Upon this property, A. Tschirch bases the following simple method for the detection of rhapontic rhubarb in the powdered Chinese rhubarb: 10 Gm. of the powder are boiled for a quarter of an hour with 50 Cc. of diluted alcohol. The filtrate is evaporated to 10 Cc., and after cooling, shaken with 10–15 Cc. of ether. If the rhubarb is genuine, the

liquid will be clear after 24 hours; but if the liquid has been prepared from rhapontic rhubarb, a considerable crystalline deposit forms, which increases on standing, and when examined under the lens, proves to consist of colorless, needle-shaped prisms. If this precipitate is collected on a filter, washed with water, and dried, the crystals obtained produce a purple-red color with sulphuric acid, soon changing to orange.—Schweiz. Wschr. f. Chem. u. Pharm., *42*, No. 19 (May 13, 1905), 353.

Rhubarb—Detection of Turmeric in the Powder.—Arzberger recommends the following simple test for detecting turmeric in powdered rhubarb: About 0.1 Gm. of the powder is heaped upon a small strip of filter-paper, 6 to 8 drops of ether are dropped upon it, and the ether is allowed to evaporate. The stain produced on the under side of the paper gives in the presence of turmeric a red or rose color on dropping a drop of a hot solution of boric acid in concentrated hydrochloric acid upon it, this changing to sky-blue with ammonia or caustic alkali solution.—Pharm. Ztg., *50*, No. 26 (April 1, 1905), 271; from Pharm. Post, 1905, No. 12.

SCROPHULARIACEÆ.

Digitalis—Present Status of Chemical and Physiological Investigations.—K. Alpers, reviewing the results of the chemical and physiological researches that have been made by numerous investigators since 1899, upon digitalis leaves and its preparation, most of which have been noted in the reports on the progress of pharmacy annually contributed and published in the "Proceedings" of this Association, remarks that while the question of what constitutes an ideal digitalis preparation has not by any means been solved, sufficient progress has been made in throwing light upon the nature of the active principles of the drug and in pointing out the most promising expedients for its physiological exhibition, as well as for securing uniformity of action. Concerning the standardization of the drug and its preparations, the author observes that the studies of Focke, of Ziegenbein and, of Woskowitsch lead to the conclusion that at the present time neither the chemical nor the physiological method, nor both together, can accurately be depended on, but that the physiological method of Focke is the one that deserves preference. The conclusion drawn from the results of the more recent researches have been practically applied by several firms to the laudable endeavor to supply stable digitalis preparations possessing uniform and pronounced physiological activity. In the author's opinion the most reliable of all the digitalis preparations are the infusion and the powder; and, inasmuch as standardization by physiological or chemical methods is as yet not sufficiently accurate to meet with general acceptance, he advises in lieu thereof the adoption and observance of the following important rules by the pharmacist:

1. The stock of digitalis leaves should be renewed annually, and should be procured shortly after the leaves are gathered from reliable parties

making the supply of such a specialty, or, if this is possible, the leaves should be self-collected.

2. The leaves should at once be dried in a drying-closet at 50°–60° C. as completely as possible and enclosed in air-tight containers, on the bottom of which a tin tray is placed containing fragments of freshly-burnt lime, the tray being provided with a perforated cover.

3. The finely-powered digitalis, for convenience at the prescription counter in preparing pills, infusions, etc., should be in small quantities only, so that it may be consumed in a short time. This powder may be kept in glass containers, carefully stoppered, but better yet in such provided with a suitable receptacle for and containing freshly-burnt lime.

A strict observance of these simple rules, resulting in the reliable preservation of the drug, coupled with the conscientious preparation of the infusion, is regarded by the author, in the light of our present knowledge, of far greater importance than the attempt to standardize the drug by physiological or chemical methods of doubtful reliability and difficult of execution.—Pharm. Ztg., *49*, No. 67 (Aug. 20, 1904), 703–705.

Digitalis—Relative Value of the Chemical and Physiological Methods of Assay.—George Barger and W. Vernon Shaw have subjected a number of commercial specimens of B. P. tincture of digitalis to examination and assay, the latter being effected both by Keller's chemical method and by the physiological action on frogs. It was found that the solids in the tinctures varied from 2.6 to 4.9 per cent., and digitoxin, by Keller's method, from 0.022 to 0.038 per cent., but that these together had only about half the toxic effect upon frogs as the corresponding quantity of the original tincture—the physiological experiment being made by injecting the medicament into the dorsal lymph-sac and observing the action on the heart. Comparative experiments were also made with an artificial tincture, made by percolating hay with alcohol and subsequently adding a certain small percentage of Merck's digitoxin. It was here also found that the digitoxin resulting when the artificial tincture was treated by Keller's method had only two-thirds the toxicity as the original digitoxin from which the tincture had been prepared. The authors conclude that as yet the only reliable method for the assay of digitalis tincture is the physiological one.—Trans. Brit. Pharm.-Conf. (Yearbook of Pharm.), 1904, 541–556.

Digitalis—Advantages of Physiological Standardization and Precautions for Preservation.—In continuation of his previous advocacy of standardizing digitalis leaves by physiological methods (see Proceedings, 1904, 661), Dr. Focke expresses the opinion that experience has since proven the reliability of the method. The objection of K. Alpers, on the ground of variation in the reaction on frogs at different seasons of the year, is met, as he thinks beyond doubt, by confining the physiological experiments to the months of July, August and September on frogs caught during those

months. In general, the following rules should obtain : The standardized leaves, well-dried, and reduced to a medium-fine powder, should be kept in full and hermetically closed containers. The contents of large containers, if not used at once in making preparations, should be transferred to smaller ones—ordinary, well-dried narrow-mouthed vials—and these well corked, and stored in a tin can containing freshly-burned lime, or in a similar suitable receptacle containing lime. But in no case should the standardized digitalis leaves be used after they are more than one year old. The advantages of such standardized and properly preserved leaves are : 1. Uniformity in strength, hence avoidance of complaints covering insufficient activity. 2. Independence of the supply from the season of the year. 3. The possibility of preparing at all times tinctures (or infusions) of uniform strength and reliable activity.—Pharm. Ztg., *50*, No. 2 (Jan. 7, 1905), 19–20.

Digitalis Leaves—Value of Air-Tight Preservation.—Cæsar and Loretz, depending on the physiological valuation of the digitalis leaves proposed Dr. C. Focke, have found powdered digitalis leaves which had been preserved in air-tight containers for one year, to have retained its original physiological activity unimpaired.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

SOLANACEÆ.

Belladonna Root—Rate of Exhaustion by Percolation.—Elsie S. Hooper communicates the details of experiments undertaken with the main object of ascertaining in what degree the reserve percolate obtained in the preparation of liquid extract of belladonna root, B. P., represents the active constituents of the drug, and incidentally, to determine the most suitable method of manipulation, as well as the best process for the assay of the product. The results of these very interesting experiments are summarized by the author as follows :

1. The exhaustion is most rapid when the drug is moistened with 25 Cc. for every 100 Gm. weight of the drug.

2. The exhaustion of the B. P. method is defective in two respects (*a*) The quantity of menstruum to moisten is too large. (*b*) It is inexpedient to pour on liquid till it drops through, and then close and macerate.

3. Practically the whole of the alkaloid of 800 Gm. is contained in the first 300 Cc. of percolate obtained by repercolation in four quantities under proper conditions.

4. The assay of the root by Keller's, Panchaud's, Dunstan's, and Bird's processes, are practically identical. On account of rapidity and simplicity, Keller's or Panchaud's process deserves the preference. On the basis of these results, the author has formulated and recommends the following process of

Repercolation of Belladonna Root: Moistening 200 Gm. of the root

with 50 Cc. of the menstruum, collecting the first 50 Cc. of percolate, and using this to moisten a second quantity of 200 Gm. The subsequent percolates are collected in fractions of 100 Cc., the strongest being used first to percolate the second quantity of drug, and so on for four quantities of 200 Gm. each.—Pharm. Journ., July 30, 1904, 140–142.

Paprika—Normal Sand Content.—R. Windisch regards a sand content up to 0.5 per cent. in paprika to be a normal constituent; above that, and up to 1.5 per cent., the drug may be regarded as simply impure; but if the percentage of sand exceeds 1.5 per cent., it should be refused.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 476; from Ztschr. landw. Versuchsw. in Oesterr., 1905, *8*, 73.

Potatoes.—Presence of a Fusel Oil producing *Bacillus.* See *Fusel Oil* under "Organic Chemistry."

Tobacco—Protection of the Plants by Cheese Cloth.—W. Fawcett says that immensely profitable results are being obtained in cigar-leaf-producing countries by the growing of cigar wrapper leaf under a special cotton fabric, known in Cuba as cheese cloth and in the United States as tobacco shade cloth. The effect of growing under cloth is to increase the yield of leaf as compared with that grown in the sun, and the leaves are perfect, being neither torn by the wind and rain nor eaten by insects, and the plants start to grow more rapidly, the leaves are thinner, of finer texture, and more desirable in every respect for the wrapping of the finest grades of cigars. The cloth is stretched on framework over the field and also hangs down at the side of the field like walls. There are about 2,000 acres so treated in Cuba, in Porto Rico about 250 acres, in Florida 2,500 acres, and 700 more in other parts of the United States where cigar leaf is grown. The plan is also being tried in the East Indies.—Pharm. Journ., Dec. 31, 1904, 958; from Bull. Dept. Agricult., *2*, 207.

Tobacco — Chemical Examination. — R. Kissling communicates in "Chem. Ztg." (1904, No. 66), a noteworthy description of a systematic analytical method for the determination of the constituents of tobacco—moisture, ash, alkalinity, alkaloid, resins, organic acids (oxalic, malic and citric), etc., which, with the exception of the following method of

Nicotine Determination must be consulted in the original: 10 Gm. of the powdered tobacco and 10 Gm. of powdered pumice are mixed and saturated with 10 Gm. of solution of sodium hydrate containing about 50 Gm. NaOH in the liter. The moist powder is enveloped in blotting paper and extracted with ether in a Soxhlet apparatus in the well-known manner, so that 50 to 60 drops of the ether shall drop upon the enveloped mass in a minute during several hours continuous extraction. The ether is then carefully and completely distilled from the extract, this is transferred with a little solution of potassium hydrate and water to a flask, and subjected to distillation in a current of steam, collecting the distillate in fractional

portions of 100 Cc. These distillates are titrated as fast as obtained with sulphuric acid, using by preference luteol as indicator which yields a sharper color-reaction than rosolic acid. Under these conditions, the fifth portion of distillate is usually nearly free from nicotine, the quantity of which is determined on the basis of 2 molecules for 1 molecule of H_2SO_4 required for its saturation.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 772.

Tomatoes—Poisoning by Unripe Fruits.—Paradis reports two separate cases of poisoning from eating unripe tomatoes. The symptoms were colic and violent diarrhœa, with dilatation of the pupils; the treatment, which was rapidly successful in removing the worst symptoms, consisted in the administration of ipecacuanha and hot alcoholic stimulants. It is evident that care should be exercised that the fruit used for the table be fully ripe, since it is not improbable that toxic substances may occur in the immature fruit of this solanaceous plant.—Pharm. Journ., April 8, 1905, 514; from Nouv. Remèdes, *21* (1905), 115.

LABIATÆ.

Peppermint—Cultivation in the United States.—Through the agency of their New York house, Messrs. Schimmel & Co. have endeavored to make a thorough inquiry respecting this year's (1904) harvest of peppermint, by sending an expert to the respective districts in Michigan and Indiana, in which the plant is cultivated for the distillation of oils, and also to Wayne county, New York. The detailed report has been received and is published in the semi-annual report of this firm for October–November, 1904, 70–74.

BIGNONIACEÆ.

Stereospermum Euphoriodes—Characters of the Gum Yielded by the Plant.—H. Jumelle describes the gum yielded by *Stereospermum euphoroides*, a plant indigenous to Madagascar, as forming brown, clear, hard, brittle masses, with a brown, shining fracture. It is sparingly, but completely soluble in cold water to the extent of 1.60 to 1.70 only, and the solubility is not much increased on warming. It is also soluble in alcohol (95 per cent.), in acetone, and in terpineol, but practically insoluble in other solvents. The aqueous solution precipitates both with basic and neutral lead acetate, and with ferric chloride, the presence of a little tannin giving a green color-reaction. It gives no reaction with tincture of guaiacum, and does not reduce Fehling's reagent. Its sparing solubility in water will probably prevent the gum from being used for any practical purposes.—Pharm. Journ., Febr. 11, 1905, 193; from Compt. rend., *140* (1905), 172.

GENTIANACEÆ.

American Centaury—Adulteration and Substitution.—Rodney H. True calls attention to a number of samples of American centaury received from

an eastern drug-house, which had aroused suspicion on account of certain difference in appearance from the genuine drug. Examination proved these samples to be wholly or in part composed of *Rhexia mariana*, commonly known as deer grass or meadow beauty, the remainder being the true article, *Sabattia angularis*.—Amer. Journ. Pharm., May 1, 1905, 213–215.

APOCYNACEÆ.

Gymnea Leaves—Chemical Examination.—Frederick B. Power and Frank Tutin record the results of a chemical examination of the leaves of *Gymnea sylvestre*, a plant indigenous to Banda and the Deccan Peninsula, to which various medicinal properties have been attributed by the Hindus, but which has come more prominently into notice in consequence of the observation that the leaves, when chewed, have the property of rendering imperceptible the sweet taste of sugar and other saccharine substances, and also, but in a less marked degree, the taste of many bitter substances. In 1887 these leaves were examined by Hooper, who found them to contain besides a neutral bitter principle and more or less unimportant constituents, a peculiar acid, "gymnemic acid," stated to be present as a potassium salt, to which the specific properties of the leaves were attributed. The authors' examination showed in the first place the absence of a cyanogenetic compound, such as had been observed by Greshoff to exist in the leaves of *Gymnea latifolium*, but they established the presence of the following constituents: 1. A resinous substance, from which by suitable treatment they isolated a crystalline hydrocarbon, $C_{31}H_{64}$, melting at 68° C., and identified as *hentriacontane*. 2. *Formic* and *butyric acids*. 3. Hooper's "gymnemic acid," in reality a dark colored resinous product, from which on further treatment an amorphous product was obtained, for which the name "gymnemic acid" may conveniently be retained; but even in its purest form in which the authors have succeeded to obtain it, there is no assurance that it represents a homogeneous substance. It is sparingly soluble in ethyl acetate, readily soluble in alcohol, and insoluble in ether, chloroform, benzene and water. It is not a glucoside, but has weak acid properties. Its anti-saccharine properties are more pronounced, naturally, than those of the impure preparation of Hooper, but are destroyed by heating with the fixed alkalies or with dilute acids. 4. An *acid resinous body*, insoluble in ethyl acetate, and constituting the principal impurity associated with the "gymnemic acid," but completely devoid of any anti-saccharine properties. 5. A *lævo-rotatory modification of quercitol*, associated with a sugar corresponding to *inactive glucose*. Neither "gymnemic acid," nor the acid resinous body with which it is associated in its crude condition possesses toxic properties, nor could any pronounced physiological effects be observed when these substances were administered to the lower animals in doses of 0.5 to 1 Gm.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 526–541.

Nux Vomica—Collection and Preparation for the Market in India.—A recent number of the Calcutta "Capital" contains an article on the collection and condition of the trade in nux vomica, from which it appears that the drug is collected very extensively on the Eastern Ghats, especially in the districts of Ganjain, Godavari and Nellore. The seed is included in the general items of minor forest-produce, and the right to collect is yearly sold to the highest bidder. The right to collect over fixed areas sells very well in some districts where certain firms engage to purchase all the produce; at other times the demand falls, and the godowns become stocked owing to the absence of buyers. The seeds are sent to Bombay, where they are transhipped to the United Kingdom and the United States. The nux-vomica tree has an imposing appearance, bearing the autumn clusters of greenish or yellow fruits according to their maturity. The fruits are of the size of an apple, and contain a soft pulp, in which are imbedded numerous round flattened seeds of a grayish-green color. The finest quality of seed is obtained by collecting the fruits, washing out the seeds and drying them in the sun, when they have a silvery sheen. When collected by native tribes in the jungle, these people do not scruple to gather from under the trees, the seeds which have been rejected by the birds and monkeys, who eat freely of the pulp when ripe, and this accounts for the earthy appearance of some of the parcels offered on the London market.—Chem. & Drugg., Sept. 3, 1904, 452.

Nux Vomica—Distribution of Fat and Strychnine in the Seeds.—In common with other manufacturers, H. Whippel Gadd and Sydney C. Gadd have had some trouble in making the official (B. P.) liquid extract of nux vomica, on account of the fat which the seeds contain. On passing some previously steamed seeds through a Carter disintegrator, the centrifugul action of the latter separated the light hairs from the heavier particles, and this suggested an investigation which resulted in the determination that the hairs, amounting to 5 per cent. of the whole, contained proportionately much more fat (7 per cent.) and less strychnine (0.5 per cent.) than the remainder of the seed, which contained 1.5 per cent. of strychnine and only 2 per cent. of fat. Moreover, the fat is more readily removed from the hairs by (70 per cent.) alcohol than from the denser portions of the seed, and may therefore, with advantage, be removed from the seeds before converting them into liquid extract.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 515–518.

SAPOTEACEÆ.

Palaquium Oblongifolium—Characters of the Fat in the Seeds.—According to A. W. K. de Jong and W. R. Tromp de Haus, the kernels of the seeds of *Palaquium oblongifolium* yield 32.5 per cent. of fat, which has the following characters: m. p., 38°-40° C.; acid value, 4.2; saponification value, 201.5; iodine value, 34.3; Hehner value, 95.9; the fatty acids

melt at about 60° C.; they consist of a mixture of stearic, palmitic and oleic acids.—Pharm. Centralh., *45*, No. 42, Oct. 20, 1904, 814; from Chem. Ztg., 1904, 780.

COMPOSITÆ.

Arnica Root—Adulterants and Substitutes.—J. M. y Guindal calls attention to the following roots which are stated to be employed to sophisticate arnica root: *Inula montana, I. helenoides, I. oculis christi, I. britannica;* several species of *Doronichum, Astericus, Calendula, Jasione glutinosa,* and species of *Senecio, Tragopogon,* and *Hypochæris.*—Apoth. Ztg., *20* (1905), 178; from Rev. Sci. de Barcelona.

Aya-Pana—Adulteration and Inferiorities.—P. Planes states that although only the leaves of *Eupatorium aya-pana* are of medicinal value, the commercial drug usually contains an admixture of 40 to 50 per cent. of fragments of the stem. These stems, too, are not always those of the true drug, but are frequently mixed with those of the nearly allied *Eupatorium cannabinum.* The leaves have been carefully picked off these stems, since their presence would at once reveal the fraud; the leaves of *E. cannabinum* being deeply tri-lobed and dentate, whilst those of *E. aya-pana* are one-lobed and lanceolate. The care necessary in this adulteration is remunerative, the false drug having only about one-twelfth the market value of the true. Microscopic examination of the transverse section of the stems at once differentiates true aya-pana from false. The former is free from hairs, the cortical tissue is parenchymatous, and the arrangement of the fibrovascular bundles quite distinct from that of *Eupatorium cannabinum;* in the latter also many hairs are present, and the cortical tissue is collenchymatous.—Pharm. Journ., June 17, 1905, 875; from Journ. Pharm. Chim. (6), *21* (1905), 534.

Carthamus Tinctorius—Yield and Properties of Oil from the Fruit.—G. Fendler finds that the fruit of *Carthamus tinctorius* from German East Africa yields 25.82 per cent. of fixed oil; the separated kernels of the seeds give 50.37 per cent. It has the following characters: Sp. gr. at 15° C., 0.9266; m. p. 5° C.; it begins to cloud at —13° C., and is not wholly solid at —18° C. Reichert-Meisl value, 0; acid value, 11.63; saponification value, 191; iodine value, 142.2; refraction index at 40° = 65. It is a slow drying oil. The fatty acids of the oil have the sp. gr. 0.9135 at 15°; m. p. 17° C.; freezing-point, 12° C.; acid value, 199; mean molecular weight, 281.8; acetyl number, 52.9; iodine value, 148.2. The liquid fatty acids have the iodine number 150.8, and the mean molecular weight 293.1.—Apoth. Ztg., *19*, No. 74 (Sept. 14, 1904), 121; from "Tropenpflanzer," 1904, 511.

Erva da Botao—A Brazilian Remedy for Snake Bites.—Some specimens of an herb, presented to Mr. E. M. Holmes under the name of "Plumeria" as a reputed remedy for snake bites in Brazil, have been identified at the Kew Herbarium by Mr. T. A. Sprague as

Eclipta alba Hassk. Mr. Holmes states that the popular name of this plant seems to vary. It is known as "Lanceta" near Rio de Janeiro, and as "Erva da Botao" in the provinces of Minas Geraes. The plant is not confined to Brazil, however, but is common in the tropics. The juice of the stem when broken becomes bluish.—Pharm. Journ., Dec. 17, 1904, 893.

Lactuca Muralis—Occurrence and Distribution of Mydriatic Alkaloid in the Plant.—The discovery by Dymond of a mydriatic alkaloid in *Lactuca virosa*, and the subsequent confirmation of its presence by Farr and Wright (see Proceedings 1904, 672), has prompted the last-named chemist to examine *Lactuca muralis*, a plant fairly well distributed over the British Isles, in order to ascertain whether or not it contained a similar principle. For this purpose a quantity of the plant was collected by the author at Ashford-in-the-Water, near Bakewell, in September, 1904. The different parts were separated and carefully dried at a low temperature. The following were the weights of the respective portions: Roots, 17 Gm.; stalks, 92.5 Gm.; leaves, 42 Gm.; flowering tops, 13.5 Gm. A preliminary examination gave negative results, but on employing a special process, and by careful treatment for its extraction, which absolutely precluded loss of alkaloid in any stage, minute quantities of such were obtained from each part of the plant. All the residues when dissolved in a little very slightly acidulated water gave characteristic precipitates with Thresh's and Mayer's reagents, and each solution when instilled into the eye produced distinct mydriasis. The following figures represent the yield of alkaloid by the different parts of the dried herb:

Root	9 Gm.	= 0.0014	= 0.15 per mille.
Stem	90 Gm.	= 0.0019	= 0.02 per mille.
Leaves	40 Gm.	= 0.0023	= 0.06 per mille.
Flowering tops	13 Gm.	= 0.0006	= 0.046 per mille.

—Pharm. Journ., April 15, 1905, 548.

Lactucarium—Collection in the Valley of the Mosel.—G. Kiefer speaks interestingly of the plants yielding lactucarium, which, as obtained from *Lactuca sativa* was known to the ancients by the name of "*Thridax*," and is called "thridace" by the modern French. While it is still produced in France from the juice of *Lactuca sativa*, the product is inferior in efficiency to the Lactucarium produced from *L. virosa*, cultivated in the Mosel valley, where also *L. Scariola*, a so-called compass plant, is abundantly found wild. The plant yielding the lactucarium, being a biennial, the juice is collected during the second year of its growth, beginning at the end of May and continuing until August. A small but very thin segment is cut from the stem of the plant, every morning, and the exuding latex scraped with the fingers into a porcelain cup. This continues during the entire day, from plant to plant, and from day to day, for sixty or seventy days' and is very laborious, since the daily yield from about 500 plants is required to fill the

cup. Morning and evening dews are avoided during the harvest. The juice soon coagulates, becomes viscid and thick ; the mass is then removed by gently heating the cup, and tapping on it—a truncated cone being thus obtained, which is quartered and dried on trays or straw in the sun, or, to avoid the formation of fungi, generally in stoves. Regarding its use in medicine, it has become obsolete in Europe, but is still collected extensively, finding a market in America (the U. S.), presumably for the preparation of so-called patent medicines.—Pharm. Ztg., *50*, No. 14 (Feb. 18, 1904), 143.

Taraxacum—Activity Probably Due to an Acid Oleo-Resin.—L. D. Havenhill has made some interesting researches on taraxacum, the results of which, while confirming in the main those obtained by others, seem to justify the hope that it may be possible to show that the bitter principle of this drug is an oxidation product, at no time present in great quantities, that it reaches its maximum when the plant metamorphosis is taking place the most rapidly, and that the activity of taraxacum is not due to this bitter principle, but to *an acid oleo-resinous substance* which the author has succeeded in isolating. This is reddish-yellow, possesses an extremely acrid taste, and in very small quantities produces a persistent burning sensation in the back part of the mouth and throat. Its properties have not been sufficiently studied to venture an opinion respecting its precise nature other than that it seems to be an active constituent of the plant.—Proc. Kansas Pharm. Assoc., 1904, 63–68.

VALERIANACEÆ.

Valerian—Cultivation in Derbyshire.—F. A. Upsher Smith describes the method of cultivating valerian rhizome on a farm in Derbyshire. The rhizomes are derived from wild plants which are collected in the spring and transplanted to land fertilized with yard manure. These plants are of two kinds, older plants that will flower the first year, and daughter plants that will not flower the first year. It is necessary to cut the flowering stems of the flowering plants as they appear, leaving only the lower leaves. In this way the whole of the plants' strength will be found in the rhizome in autumn. About September, or early in October, the whole of the tops remaining above ground are cut off with a scythe, the rhizomes dug up and filled in perforated boxes, which are placed in running water that washes away the earth ; then they are dried in a shed with perforated floor, below which is a coke stove. They are now ready for the market. At the suggestion of Mr. E. M. Holmes, the author has endeavored to ascertain whether the Derbyshire drug is the product of *Valeriana sambucifolia*, Mikan fil., or of *V. Mikanii*, Syme. The balance of testimony in the author's possession appears to point to the latter as the probable source. —Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 557–561.

In a subsequent paper the author and Eric Drabble give the results of

further investigations which confirm the opinion previously expressed that *V. Mikanii* is the plant cultivated, under the conditions above named, in Derbyshire.—Pharm. Journ., Nov. 12, 1904, 701–702.

RUBIACEÆ.

Flat Calisaya Bark—A New Variety.—E. M. Holmes draws attention to a specimen of calisaya bark which has recently reached the English market, which consists of flattened pieces deprived of a corky layer. It resembles in appearance the old Charquesillo bark referred by the late Mr. J. E. Howard to the *Cinchona boliviana* of Weddel and the *C. Calisaya* var. *morada* of Planchon, but it differs in having a much more pitted appearance. It is certainly, however, closely allied to the *morada* variety, judging by the fact of its easy defoliation, which is caused simply by the pressure exerted in flattening the quills during the drying process, and is characteristic of Weddel's *C. boliviana.* Mr. David Howard has analyzed this bark, and reports the following percentage, viz.: Quinine alkaloids, 5.14 per cent.; cinchonidine, 0.24 per cent.; cinchonine, 0.34 per cent.; quinidine, 0.16 per cent.; amorphous alkaloid, 0.56 per cent., which he states is analogous in character to that of calisaya of the *ledgeriana* type. It has hitherto come into the market in some small parcels, and therefore presumably from separate districts, or at all events from separate groups of trees. Such rich barks are usually offered in the quinine-makers' market, and it is therefore gratifying to find that they are able to occasionally enter into retail commerce.—Pharm. Journ., Dec. 17, 1904, 893.

Cinchona Bark—Red Color Induced by an Enzyme.—A. Tschirch, having, in 1889, noticed that cinchona bark is colorless immediately after its removal from the plant, but begins to redden within fifteen seconds thereafter, has caused experiments to be undertaken at the government plantation Tirtasari (Bandveng), at first by Dr. van Leersum, and afterwards by J. Victor Sibinga, which have confirmed his supposition that the red coloration of this bark is due to the fermentative action of an enzyme, which, as in the case of the red coloration of fresh cuts of kola nuts, is either a hydrolytic ferment or an oxydase, and that, as in the latter instance, the formation of a red color fails if the branch from which the bark is taken is first exposed to a temperature of 80° C., which renders the enzyme inactive. It is probable that cinchona bark contains a tannoid, which after the removal of the bark is split up by the enzyme, with formation of cinchona red itself, or a product that is subsequently transformed into this. This enzyme is more resistant to dry heat than to moist heat, for it suffices to heat it in water at 80° for 15 to 30 minutes, to destroy its activity, whereas when exposed to the same temperature in a drying-oven, for as much as 3 hours, the reddening of the bark followed its removal, although diminishing in correspondence with the period of exposure; and this reddening was developed after the branch had been exposed for half an hour

at 100° C. Experiments are now under way to ascertain the precise nature and function of this enzyme.—Schweiz. Wschr. f. Chem. u. Pharm., *43*, No. 10 (Mar. 11, 1905), 125.

Cinchona Barks—Alkaloidal Percentage in Commercial Parcels.—Willard Graham reports the results of alkaloidal assay in commercial cinchona barks. Four samples of yellow cinchona contained respectively 7.5, 4.8, 8.9, and 8.4 per cent. of total alkaloid. Seven samples of red cinchona bark yielded 5.7, 6.8, 6.7, 6.1, 6.7, 7.5 and 8.8 per cent. of total alkaloid respectively.—Proc. Penna. Pharm. Assoc., 1904, 129.

Cinchona—Alkaloidal Determinations.—Dr. G. Fromme has made an experimental inquiry into the reliability of Panchaud's modification of Keller's method for determining the alkaloids in cinchona bark; this modification, consisting essentially in the titration of the alkaloid in the presence of some ether and alcohol, and about an equal bulk of water, with $\frac{N}{10}$ hydrochloric acid, using hæmatoxylin as indicator. The results obtained by this method were uniformly lower than those obtained by the author's own method (see Proceedings, —), which he has reason to believe to be accurate and reliable, and lead him to the following conclusions:

1. The method of Keller for the extraction of the alkaloids from powdered cinchona, as modified by others, and recently by Panchaud, is unreliable.

2. The extraction of the powdered bark is easily and completely accomplished with hot water and hydrochloric acid, and from this solution, after rendering it alkaline with soda solution, by the usual shaking-out process.

3. For complete extraction under these conditions, it suffices to use a moderately fine powder.

4. The final determination by titration is not commendable in general, but if the method of Panchaud is used, the complete elimination of ether is a necessary condition.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

Java Cinchonas—Assay Process and Yield.—Burr M. Overton communicates some interesting information secured from Mr. B. S. Riorden, U. S. Consul at Batavia, concerning the cultivation of cinchona in Java, which is confined to two species, viz., *Cinchona ledgeriana* and *C. succirubra*. Having obtained several samples of ledgeriana bark, he submitted one lot to assay, with the view of not only determining its percentage of total alkaloids, but also as a comparison of the methods used and the results obtained. By Prollius' method (see Proceedings 1892, 260) this bark yielded 6.70 per cent. of total alkaloid; by Haubensak's method (*Ibid.*, 745) the yield was 6.85 per cent.; the U. S. P. method yielded 6.30 per cent. Of the three methods the authors prefer that of Haubensak, both for its simplicity and for the results obtained.—Proc. Ky. Pharm. Assoc., 1904, 68–69.

Ipecacuanha—Identification.—C. Hartwich gives the following systematic description, which is intended to aid in the identification of ipecac and some of its substitutes, chiefly by means of the characters of the transverse sections of the respective roots or rhizomes:

A. Dicotyledonous Roots:

I. Starch present in quantity.

(*a*) Section of wood abnormal, medullary rays and wood being indistinguishable. (1) Elements of the wood radially arranged; bark contains raphides: *Rio* and *Carthagena ipecacuanhas* (distinguished by the size of the starches). (2) Elements of the wood not radially arranged; bark contains raphides; vessels up to 175μ in diameter; in the bark occasional parenchymatous cells with black contents: *Poaya de flor azul.*

(*b*) Section of wood normal. (1) Bast fibres in bark: *Ipecacuanha fibrosa.* (2) No bast fibres. α, Bark contains raphides: *Ipecacuanha nigra* (starch grains up to 6μ; medullary rays up to 2 cells wide) or *Richardsonia scabra* (single starch grains up to 22.5μ, compound 42.5μ; medullary rays 1 cell wide. β, Bark contains rosettes of calcium oxalate: *Triosteum perfoliatum* (bark contains large cells); *Naregamia alata* (bark contains orange-red secretion cells and is very thin). γ, Bark contains oxalate in columnar prisms; *Guatemala ipecacuanha* (starch grains small, rounded, scattered). δ, No oxalate; polygalaceous roots: *Polygala carcasana* (medullary rays of the wood 1 cell wide); *Polygala angulata?* (rays 3 cells wide).

II. Bark contains sugar: *Psychotria emetica* (wood normal) raphides present).

III. Bark contains inulin (or analogous substance): *Heteropteris pauciflora* (wood normal, stone cells, oxalate in rosettes, tannin cells); *Ionidium* sp. (wood abnormal, stone cells small and often absent, oxalate in long prisms).

B. Monocotyledonous rhizomes: *Cryptocoryæ spiralis* (raphides; brown-red secretion cells, which turn brilliant red with vanillin and hydrochloric acid).—Arch. d. Pharm., *242*, No. 9 (Dec., 1904), 647.

Ipecacuanha—New Adulterant.—C. Mannich and W. Brandt have examined the roots of a new ipecacuanha adulterant to which Th. Peckolt has recently drawn attention in Rio Janeiro. They are the roots of

Heteropteris pauciflora (N. O. Malpighiaceæ), and present some resemblance to genuine ipecacuanha, being grey in color, branched, and exhibiting transverse swellings. These are one-sided, and the wood, therefore, appears eccentric. Transverse fissures, reaching to the wood, are frequently to be observed. The section is finely granular, and exhibits numerous glittering points; the diameter of the root is about 4 Mm., that of the wood about 1 Mm. From ipecacuanha they are distinguished by their grey rather than brown color, by the prominent annulations, and by the longitudinal striations on the surface. The transverse section showed

a cork layer about 6 to 10 cells wide, the outer being filled with a dark-brown pigment. Cells filled with a similar pigment are also found in the cortex, which exhibits in addition rosette crystals of calcium oxalate and hyaline lumps of a reserve material, but no starch grains. The sieve tubes are accompanied by vertical rows of cells containing prismatic crystals of calcium oxalate, and in the wood vessels, attaining as much as 70μ in diameter, are to be found. There are, therefore, abundant means of distinguishing this drug, even when powdered, from genuine ipecacuanha, or detecting its presence. Chemical examination showed the absence of emetine, or, indeed, of any alkaloid. The reserve material proved to be a carbohydrate closely resembling, although apparently not identical with, triticin, and yielding, like triticin, by hydrolysis, levulose; it may provisionally be termed heteropterin.—Pharm. Journ., July 30, 1904, 147; from Ber. d. d. Pharm., Ges., *14*, 302.

Ipecacuanha—Method of Assay.—Dr. G. Fromme finds the method proposed by Panchaud for the valuation of ipecacuanha to be commendable by reason of its accuracy and extreme simplicity. 6 Gm. finely-powdered ipecac, 120 Gm. ether and 5 Cc. ammonia water (10 per cent.) are frequently and vigorously shaken during one hour and allowed to clarify by subsidence for 5 minutes. Then 100 Cc. of the clear solution are decanted, distilled to 20 Cc., 5 Cc. alcohol, 3 drops hematoxylin solution and 10 Cc. of water added, followed afterwards by 30 Cc. more of water, and titration with $\frac{1}{100}$ normal acid. Dr. Fromme considers it to be an improvement, however, if the ether is distilled off completely before titration—the presence of ether causing a slight increase in the apparent alkaloidal content (2.217 per cent. instead of 2.170 per cent.). —Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

CAPRIFOLIACEÆ.

Sambucus Ebulus—Constituents and Uses.—A. Blanc, in a thesis presented to the "École Sup. de Pharm.," Montpelier, gives some interesting information concerning the dwarf elder or Dane's blood in the vernacular, *Sambucus ebulus*. This is widely spread throughout Europe, but is decidedly a local plant in Great Britain. It has been used in medicine since the time of Dioscorides, and is still used by herbalists to some extent. It has in the structure of the stem two characteristic features, the one that the collenchyma which forms a ring below the suber or cork becomes lignified, commencing on the inside of the cellular membrane on the edge of the lumen of the cell; and the other in the formation of tubes containing tannin around the pith, these tubes being formed by elongation of the ordinary cells of the pith, and often extending from one node to another. He has found that the plant contains an alkaloid which is easily decomposed, even in the form of sulphate, an essential oil with a strong and disagreeable odor; also a resin with an odor like that of new leather, which

appears to be formed by the oxidization of the essential oil, and tannin. The properties of the plant are diuretic and purgative. It has been used more especially for dropsy, and sometimes in pleurisy and pericarditis. The diuretic action resides more especially in the inner bark. Its prolonged use in moderate doses gives the best effects, especially in Bright's disease. As a drastic purgative the powdered root gives satisfactory results, and in small doses can be used as a laxative and expectorant. The author gives in his thesis various formulæ for preparations of the plant.—Pharm. Journ., Mar. 11, 1905, 367.

Sambucus Nigra—Tyrosine a Constituent of the Fruit.—Sack and Tollens have obtained *Tyrosine* from elderberries by boiling the mashed fruit with water, treating the exposed liquid with lead subacetate to remove coloring matter, acids, etc., the excess of lead with hydrogen sulphide, and concentrating the filtrate by evaporation. On cooling, crystals were deposited, which proved to be tyrosine—thus confirming the occurrence of that base in vegetable substances.—Pharm. Ztg., *50*, No. 10 (Febr. 4, 1905), 101; from Ber. d. D. Chem. Ges., 1904, *37*, 4115.

Ranunculus Pensylvanicus var. *Japonicus—Chemical Examination.*—Keimatsu has subjected the herb of *Ranunculus Pensylvanicus* var. *Japonicus* Maxim. to chemical investigation, and has isolated from it the body described by Beckurts as

Anemone-Camphor. He finds, however, that this substance is easily converted into *anemonin*, $C_{10}H_8O_4$, and *isoanemonin*, and not, as stated by Beckurts, into *anemonin* and *isoanemonic acid.*—Pharm. Ztg., *49*, No. 74 (Sept. 14, 1904), 783; from Journ. Pharm. Soc., Japan, 1904, No. 268.

Hydrastis—Possible Confusion and Substitution with Other Rhizomes.—Hartwich and Hellström call attention to the possible confusion, substitution or adulteration of hydrastis rhizome with the rhizomes of other plants, such as *Aristolochia Serpentaria*, *Leontice thallictroides*, *Jeffersonia diphylla*, *Stylophorum diphyllum*, *Trillium sesiliflorum* and *Cyprepedium pubescens*, and communicates a microscopic key, in which the distinctive microscopic characters of these several rhizomes are systematically described.—Apoth. Ztg., *20*, No. 35 (May 3, 1905), 345.

BERBERIDEÆ.

Rusot—An Ancient Eastern Medicine Prepared from Several Species of Berberis.—David Hooper, after giving an interesting historical account of an East Indian extract called "rusot," which is prepared from the wood and roots of several species of *berberis*, and tracing its connection and identity with the ancient eastern remedy mentioned by various older writers under the name of *Lycium* or *Lykion*, describes the remedy as it is found at present in India, the method of its preparation and its composition. Three species of Indian barberry are used in preparing this extract,

namely: Napal barberry (*Berberis aristata*, De.), Ophthalmic barberry (*B. lycium*, Royle), and Indian barberry (*B. asiatica*, Roxb.). The extract is obtained by digesting slices of the bark, root and twigs of these plants in water for a few hours, then boiling, straining, and evaporating to a soft consistence. It is a dark-brown extract of the consistence of opium, having a bitter and astringent taste; almost entirely soluble in distilled water, partly in alcohol, and containing, according to source, from 2.90 to 7.75 per cent. of berberine. As in ancient times, its use seems to be practically confined to diseases of the eye.—Pharm. Journ., Oct. 1, 1904, 473–475.

MENISPERMACEÆ.

Calumba—Falsification.—Discussing the adulteration to which Calumba root has been subjected, E. M. Holmes mentions particularly the false calumba root noticed by Mr. T. Wardleworth several years ago, and examined by F. H. Alcock in 1901 (see Proceedings, 1902, 856), which was particularly noteworthy on account of the large ash-content. This adulterant, which was present in the drug to the amount of 25 per cent., was attributed to *Tinospora Bakis*, Miers, by Mr. Wardleworth, a plant which had been described several years before (1895), by Dr. Heckel. The description of the root does not, however, agree with the false calumba of Alcock, since Dr. Heckel states that Bakis root is remarkable for the exfoliation of its epidermis, and that immediately below the epidermis the tissue has a chalky appearance, which is not the case with the adulterant in question, which has a hard, shriveled, closely-attached bark, about a line in thickness, and porous rather than chalky. The transverse sections, which are mostly ½ in. to ¾ in. in diameter, contain a number of distinctly visible woody bundles, which cause the centre to be prominent instead of depressed. In other particulars these pieces correspond fairly with the calumba. The epidermis of the root is of the same color, the relative width of the cortical portion is the same. The porous vessels are similarly cribriform, and the starch is practically identical. It seems probable, therefore, that those woody pieces are derived from the root-stock or portion of the root from which the fascicled tuberous roots spring, or from the top of the fusiform roots themselves. A similar woody development occurs in belladonna root in the upper portion of the root. The taste and color of the woody root are also like those of calumba. The larger amount of ash that Mr. Alcock noticed in specimens containing the supposed adulteration is perhaps only such as might be expected from the more woody structure. Mr. Holmes' view that the supposed adulteration is only a woody portion of the calumba root is supported by the fact that Mr. P. E. F. Perredès also examined similar specimens, and came to the same conclusion.—Pharm. Journ., Dec. 17, 1904, 892.

RUTACEÆ.

False Buchu—Description.—E. M. Holmes, reviewing the different forms and substitutes for buchu that have made their appearance from time to time on the market, calls attention to a new variety imported from South Africa as "Karoo buchu," which is derived from *Diosma succulenta*, L. The leaves of this variety are small and heath-like, but thicker, and slightly more oval than the subulate kind, obtuse and slightly recurved. The leaves were found to contain a considerable amount of mucilage and 26.5 per cent. of extractive matter. The oil obtained by steam distillation was semi-solid, and remained so during August; it possessed a peppermint odor, and gave a faint purple coloration with ferric chloride solution, indicating the presence of diosphenol.—Pharm. Journ., Dec. 17, 1904, 893.

Karoo Buchu—A New Commercial Variety.—Under the heading "Karoo Buchu," C. Edward Sage describes a new variety of buchu which differs widely from the varieties usually found in commerce. The leaves are nearly oval in outline with an acute and slightly recurved apex and an entire margin. Their texture is coriaceous, and on magnification they are seen to be full of oil-glands. Their length varies from 3 to 6 Mm., and their breadth averages 1.75 Mm., from which it will be seen they are not one-quarter the size of the leaves of *Barosma betulina*. When infused in boiling water for an hour they yielded a considerable amount of mucilage and an infusion with a good aroma similar to the officinal preparation. Extracted with water they yielded 26.5 per cent. of extractive matter. The oil obtained by steam-distillation was semi-solid and remained so during August; it possessed a strong peppermint-like odor and yielded a faint purplish coloration with ferric chloride solution. These indications of the presence of diosphenol are of importance, because it is this constituent which gives the "round" buchu preference over the two "long" varieties in the British Pharmacopœia.—Chem. & Drugg., Sept. 17, 1904, 506.

In a second note the author states that this new buchu has been identified at the Kew Herbarium to be derived from

Diosma succulenta, var. *Bergiana*. The accompanying cut, (Fig. 44) exhibits the characters of distinction of the new drug: *A*, showing the leaves of *Barosma betulina*; *B*, those of karoo buchu; *C*, flowers of *Diosma succulenta*, var. *Bergiana*; and *D*, the fruit of the same—all of these in natural size.—Ibid., October 29, 1904, 737.

Brucea Sumatrana and B. Antidysenterica—Pharmacognostic Characters and Distinctions.—R. Müller gives a detailed pharmacognostic description of *Brucea sumatrana* and *B. antidysenterica*, which is here summarized, as follows:

Fruit and Seed. The epidermis of the pericarp consists in both cases

of polygonal cells, which in section are square or radially elongated and covered with a moderately thick, smooth or slightly uneven cuticle. Below the epidermis there is a hypoderma which consists of two rows of cells in *B. sumatrana*, but of only one row in *B. antidysenterica*. Both epidermis and hypoderma of the former secrete a violet coloring matter, whilst those of the latter are devoid of such. In both species the parenchymatous mesocarp gradually passes into a sclerenchymatous endocarp, and contains

FIG. 44.

A B C D

A Leaves of *Barosma betulina*.
B Karoo buchu leaves.
C Flowers of *Diosma succulenta* var. *Bergiana*.
D Fruit of *D. succulenta* var. *Bergiana*.

Karoo Buchu.

a yellow coloring matter which is difficultly soluble in water, but easily in acids and alkalies. In *B. sumatrana* the sclerenchymatous portion is divided by a layer of cells, each of which contains a dark-brown substance and a large single crystal; this layer is absent from *B. antidysenterica*.

Leaf. Epidermal cells thick-walled, with a well-developed, striated cuticle; stomata large and numerous, but on the under surface only. Palisade cells elongated in *B. sumatrana*, but unusually short in *B. antidysenterica*. Calcium oxalate in cluster crystals only. The hairs are occasionally one-celled and thin-walled, but most of them are thick-walled, lignified, warty or striated, and septate. The epidermis bears also scattered multicellular club-shaped glands. The midrib contains three bundles in *B. sumatrana*, with a secretion duct between each pair; in *B. antidysenterica* the number of bundles, as of glands, is greater.

Bark. In *B. sumatrana* this is developed from the epidermis, but in *B. antidysenterica* from the sub-epidermal layer. It consists of five to eight layers, and is succeeded by a phelloderm. Bast fibres isolated or in radially-arranged groups. Medullary rays one or two cells wide. Calcium oxalate in large cluster crystals. Starch absent.

Root. Secretion ducts absent. Cork cells thin-walled, with lignified middle lamella; no phelloderm. The secondary cortex contains bast fibres, which are scattered in the outer portion, but form a ring in the inner. Medullary rays one cell wide; calcium oxalate in large cluster crystals; starch is present. The wood contains large, in section rounded,

thin-walled vessels with simple pores.—Pharm. Journ., Jan. 21, 1905, 76; from Ztschr. d. Oesterr. Apoth.-Ver., 1905, 29 to 36.

Pilocarpus Microphyllus—Suggestion to Replace P. Jaborandi in the B. P.—In view of the growing difficulty in obtaining the jaborandi leaves official in the B. P. (from *Pilocarpus Jaborandi*), E. M. Holmes calls attention to the leaves of *P. microphyllus*—the so-called "Maranham jaborandi," which, as has been pointed out frequently in recent years, usually reach the market in good condition and are easily recognized, whilst the leaves of *P. pennatifolius* ("Rio jaborandi"), are often badly preserved and of inferior quality. Moreover, Dr. Jowett has found the alkaloidal value of the Maranham drug to be practically identical with that of the official (Pernambuco) drug, whilst according to Williams, Rio jaborandi only yields about half as much alkaloid as the Pernambuco drug.—Pharm. Journ., Dec. 17, 1904, 891.

Xanthoxylon Scandens—Proximate Constituents.—A. Van der Haar has subjected *Xanthoxylon scandens*, a Javanese plant used by the natives, under the name of "arenberegdey" as a fish poison, to proximate investigation. It appears to contain an alkaloid, the hydrochloride of which is crystalline, one or more acids soluble in acetone and in ammonium carbonate solution, as well as other acids, soluble in water but not in acetone.—Pharm. Journ., Dec. 3, 1904, 814; from Rev. Méd. Pharm., *10*, 802.

GERANIACEÆ.

Linum Catharticum—Investigation of Purgative Constituent.—James Stuart Hills has made some interesting investigations concerning the purgative constituent of *Linum catharticum*, or purging flax, a small herb growing commonly in pastures and on banks in the British Isles, which in the earliest reference (Gerard's Herbal, in 1633) is mentioned, under the name of mil-montaine, as an efficient purgative, and in a still older book by Gesner (published in Zurich in 1555) is identified by the latter with the "helleborine" of the Ancients. The herb finds some use as a "home remedy" among country people at the present day. In 1840–1843 it was the subject of chemical examination by Pachenstecher, who isolated a pure white, voluminous, powdery substance, which he named

Linin, and believed it to be the active purgative constituent; while in 1861, Schroeder obtained the same substances in the form of dazzling white, small silky-glistening crystals. The results of Mr. Hill's experiments now show conclusively that *linin possesses no purgative properties*, and is not the active principle of the purging flax. Its characters are found to be as follows: Linin, $C_{23}H_{22}O_9$, melts at about 205° C., the exact melting-point depending on the mode of heating; it crystallizes in long, fine, glistening white needles. It is insoluble in water, hydrochloric acid, or light petroleum, easily soluble in chloroform, very sparingly soluble in cold ethyl or methyl alcohol, acetone, benzene, or ether, but fairly soluble in

any of these solvents on boiling; it is somewhat more soluble in ethyl acetate. The addition of light petroleum precipitates linin from solution in any of these solvents. Linin is fairly soluble in acetic acid, and is precipitated from the solution by dilution with water; it is dissolved by heating with aqueous solution of sodium hydroxide, and is precipitated from the alkaline solution by the addition of hydrochloric or sulphuric acid. This behavior suggests that linin may be a lactone, but it has not been possible to isolate a definite salt from the solution in alkali. Linin gives with concentrated sulphuric acid a very deep purple coloration; on standing or diluting with water the color fades and a greyish flocky precipitate is produced. Linin is optically inactive; it does not absorb bromine in chloroform solution, but yields a bromo derivative on treatment with bromine in acetic acid; it is not precipitated from alcoholic solution by tannic acid, lead acetate, or basic lead acetate; the solution is neutral. Four methoxyl groups are present in the molecule; oxidation with nitric acid or alkaline potassium permanganate produces oxalic acid.

In many of its properties linin resembles Podwyssotski's picropodophyllin (see Proceedings, 1903, 631), but Dr. Henry, who compared the two substances at the request of the author, is of opinion that they are not identical, as picropodophyllin melts at 227° C., and a mixture of it with linin (m. p. 205° C.) at 184° C. Summarizing his results, the author finds the infusion and the alcoholic extract of the drug to be very strongly aperient; but the decoction, the *evaporated* infusion, the hydrolyzed alcoholic extract, and linin itself are inactive. It would seem, therefore, that the active substance existing in purging flax is destroyed by hydrolysis, and that simultaneously linin makes its appearance. The purgative principle, therefore, may be a glucoside, but all attempts to isolate it have been unsuccessful.—Pharm. Journ., Mar. 18 and 25, 1905, 401–404, and 436–438.

MALVACEÆ.

American Cotton Plants—Error in Name of Species.—W. O. Richtmann calls attention to an error in the specific names of the plants yielding respectively the short-staple or upland and the long-staple or sea-island cotton. These are stated in the U. S. Dispensatory editions of 1869 to 1899 (12th to 18th) inclusive to be derived from *Gossypium album* Haw. and *Gossypium nigrum* Haw. respectively. This reference should, however, be reversed, and the error is doubtless due to a reversal of the statement in Chapman's "Flora of the Southern United States" (1860, p. 58) that "the numerous varieties of the cotton plant are now referred to two species, the *long-staple* or *sea-island* to *G. album* (Haw.), and the *short-staple* or *upland* to *G. nigrum* (Haw.) *Gossypium album* Haw. is now referred to as *Gossypium hirsutum* L., and *Gossypium nigrum* Haw. as *Gossypium barbadense* L.

Another error that has been perpetuated in the literature is to ascribe the so-called American upland or short-staple cotton to

Gossypium herbaceum L., and apparently so accepted in the U. S. P. Mr. L. H. Dewey, of the U. S. Department of Agriculture, states that all of the upland or short staple cotton grown in the United States is *Gossypium hirsutum* L. That it is this species and not *G. herbaceum* L., can readily be determined by reference to properly labeled herbarium material. It is well-established that but little *G. herbaceum* L., is grown on the American continent.—Pharm. Rev., Feb., 1905, 42–43.

Gossypium—A Production of West African Species.—A. L. Jones has discovered a new species of *Gossypium* in Sierra Leone, which, in distinction from the North American and Brazilian species, which permits a harvest of two years only, will yield boles for a period of seven years. Gawalowski suggests that this plant is possibly a variety of *Gossypium barbadense;* Jones contends that the fibre of this cotton plant is quite as valuable as that of the North American plants.—Pharm. Ztg., *50*, No. 19 (Mar. 8, 1905), 198; from Pharm. Post, 1905, No. 8.

Cotton Seed—Reaction with Phloroglucin-Hydrochloric Acid.—The seeds of *Gossypium herbaceum* give, like all fatty seeds, the well-known vanillin-hydrochloric acid reaction; but they also produce the purple color with the phloroglucin-hydrochloric acid; but this is accompanied here by another reaction, which is characteristic, and may, according to the investigations of Winckel, prove useful for the identification of the seeds in mixtures. If this phloroglucin reagent, together with sulphuric acid, is applied to a section of cotton seed, it produces on the edges of the large secretory space a cherry-red color. This reaction is produced by *gossypol*, which does not pass into the oil on expression, but the reaction may be obtained in an oil prepared by extraction, and is of course readily obtained in the press cake of cotton-seed oil manufacture, which is not alone used by itself, but mixed with a variety of substances, such as the press cake from rope, hemp, linseed, etc.—Apoth. Ztg., *50*, No. 22 (March 18, 1905), 211.

Hibiscus Sabdariffa—Possible Use of the Calyces.—E. M. Holmes directs attention to the red succulent calyces of a variety of *Hibiscus sabdariffa*, a small shrub, commonly cultivated in most tropical and subtropical regions, which have on several occasions been submitted to him for identification during the last few years. There are two forms of the plant, one with green stems and calyces, and the other with red stems and red calyces. The latter is more generally cultivated, as having the more acid calyces of the two. In the West Indies this variety is known as the Rozelle, or red sorrel. Lunan, in "Hortus Jamaicensis," I., page 419, says: "They make agreeable tarts, and a decoction of them sweetened is commonly called sorrel cool drink, which is reckoned refrigerant and diuretic." In the Mexican Pharmacopœia an infusion of the drug is official as a refrigerant. The acidity of the calyces is due to the presence

of tartaric acid, of which 9.9 per cent. was found to be present by Lyon, the remaining free acid, totalling 15 per cent., being malic acid. The calyces give of insoluble ash 3.88 per cent., of soluble ash 2.24, the alkalinity of the soluble ash, as potash, 0.75. Besides the acid, there is the mucilage common to plants of the Malvaceæ. In the East Indies, therefore, it is found useful in dyspepsia, dysuria, and strangury. It is somewhat remarkable that the calyces, more often described as a fruit, have attracted so little attention in Europe. Other parts of the plant are also useful. The root in doses of 2 drachms forms "an easy purge," according to Hernandez. In India the leaves are used in salads and curries, and the seeds as cattle food, whilst the stems yield a strong fibre known as Rozelle hemp.—Pharm. Journ., Dec. 17, 1904, 892.

BOMBACEÆ.

Baobab Seeds—Constituents and Characters of Fixed Oil.—The baobab tree (*Adamsonia*) is a native of tropical Africa, but has been transplanted to Asia and America. The pulp of the fruit ("monkey bread") is eaten by the negroes, whilst the fat is extracted by the natives of Madagascar by boiling the crushed seeds with water. These seeds have been examined by Ballaud. They weighed about 1 Gm. each, and had a maximum diameter of 16 to 17 Mm. 100 Gm. of the seeds yielded 63.3 per cent. of kernels, which had the following composition: Water, 5.4; nitrogenous matters, 17.0; fat, 63.20; extractive substances, 9.72; cellulose, 1.05, and ash, 3.55 per cent. The phosphoric acid amounted to 1.34 per cent. Starch was not found. A specimen of the fat obtained from Madagascar was a whitish solid which began to melt at about 25° C., becoming perfectly fluid at 34° C. It had an odor recalling that of Tunisian olive oil, and was quite free from any trace of rancidity, although it had been prepared some eight or nine months. The author points out that this fat could be advantageously used in place of cocoanut oil in the manufacture of vegetable lards, and also for high-priced toilet soaps and unguents.—Pharm. Journ., Jan. 28, 1905, 113; from Journ. d. Pharm. et Chim., 1904, *20*, 529.

STERCULIACEÆ.

Cola Nuts—West African Supply.—L. Bernegau states that the chief market for cola nuts on the west coast of Africa is Lagos. They are brought in baskets holding from 500 to 1000 Kg. from ports on the Gold Coast, from Accra, Cape Coast Castle, Saltpond and Sierra Leone. In Lagos they are transferred to smaller packages and sent by rail to Ibadan, whence they reach Sokoto and Kano. From Kano they are carried by caravan across the desert to Tripoli. Large quantities also go to the Soudan. Pharm. Journ., Jan. 21, 1905, 76; from Ber. d. d. Pharm. Ges., *14*, 419.

Chocolate, Powdered Cacao Shells and Cocoanut Hulls—Histological

Distinction.—L. E. Sayre communicates a practical paper on the microscopic examination of chocolates intended to facilitate the recognition of adulteration with such substances as powdered cacao shells and powdered cocoanut hulls. The paper is illustrated by cuts showing the histological features recognizable in the powders named and in chocolate adulterated with them.—Drugg. Circ., July, 1904, 144.

Hermannia Depressa—A South African Remedy for Dysentery.—E. M. Holmes calls attention to *Hermannia depressa*, a plant which is credited with furnishing one of the most famous cures in South Africa for dysentery, the roots being the part used in the form of a decoction, which, when strained, has a claret color. They resemble the roots of carrots in shape, and are about 4 or 6 inches long. The plant is known as the "red-leaf" plant.—Pharm. Journ., Dec. 17, 1904, 894.

TERNSTROMIACEÆ.

Kutera (or Kutira) Gum—Characters.—P. Lemeland has examined the Indian gum of

Cochlospermum gossypium, which occasionally appears in commerce under the name of Kutera or Kutira gum. It is only sparingly soluble in water, the insoluble portion swelling up to a thick mucilage, which collects at the bottom of the vessel, and has but little cohesion; the supernatant liquid has no appreciable viscosity. The amount soluble in water in the specimen examined was 2.039 per cent.; it had the $[a]_D + 77° 152'$. After hydrolysis with 1 per cent. sulphuric acid, the insoluble portion became soluble, and had the $[a]_D + 71° 70'$. No indication of the presence of an oxidizing ferment was obtained. The amount of moisture, 22.723 per cent., was high, and prevented the gum from being reduced to fine powder. It gave 4.645 per cent. of ash. On hydrolysis it gave 25.795 per cent. of pentoses and 34.995 per cent. of galactose.—Pharm. Journ., Nov. 12, 1904, 705; from Journ. Pharm. Chim. [6], *20*, 253.

HYPERICINEAÆ.

St. Johnswort—Yield and Character of Volatile Oil.—Heinrich Hænsel's Report mentions that the herb and flowers of St. Johnswort (*Hypericum perforatum*), yielded by distillation with steam under pressure 0.0928 per cent. of an olive-green volatile oil, having a strong, peculiar odor, acid reaction, and depositing a little stearoptene on refrigeration. It forms a clear solution in absolute alcohol only when heated, stearoptene depositing on cooling, but it is readily soluble in ether, chloroform and petroleum ether.—Pharm. Ztg., *50*, No. 6 (Jan. 21, 1905), 61.

AURANTIACEÆ.

Mandarin Orange Tree—Development and Distribution of Proximate Constituents.—Having found that the leaves of the mandarin orange con-

tain a notable quantity of methyl-methylanthranilate, E. Charabot has studied, in conjunction with G. Laloue, the distribution of the various organic constituents in the different phases of the development of the tree. In the first stage of vegetation the leaves are richer in moisture than the twigs; in the second stage this difference becomes more marked, and increases as vegetative activity proceeds. The amount of volatile acid decreases sensibly from the twigs to the wood. It is greatest in any organ in the young state, yet the absolute quantity is greater in old than in young leaves, since it is formed in greater quantities than it is used up. The odoriferous principles are formed most actively in young leaves, and are more abundant in the leaves than in the twigs, especially when the organs are young. Later, a fresh quantity of methyl methylanthranilate is formed in the leaves; the quantity of that body increases also in the twigs, but in smaller proportions. The amount of terpenes gradually diminishes in the leaves, while it increases in the twigs, the loss in the former always being less than the gain in the latter. The oil distilled from old leaves contains more methyl-methylanthranilate than twig oil, so that it is evident that the oil secreted by the leaves becomes richer in soluble constituents as vegetation proceeds, while the reverse is the case with the oil of the twigs.—Pharm. Journ., Dec. 3, 1904, 813; from Comptes rend., *137*, 996.

Feronia Elephantum—A New East Indian Gum.—P. Lemeland reports the results of an examination of an East Indian gum derived from *Feronia elephantum*, and finds that in its composition it is closely allied to "*Cochlospermum* gum." It consists of small irregular pieces varying in size from that of a pin's head to a pea, averaging that of grains of buckwheat; varying in color from pale yellow to deep amber; the surface was bright and the fracture conchoidal. It was soluble in water to the extent of 75.338 per cent. and contained 17.752 per cent. of moisture, the insoluble residue amounting to 6.91 per cent. The mucilage was lævo-rotatory, having the $[a]_D$—6° 41′. Like mango gum, it contains an indirect oxidizing ferment. On hydrolysis it yielded 35.5 per cent. of pentoses and 42.666 per cent. of dextro-galactose.—Pharm. Journ., April 15, 1905, 553; from Journ. Pharm. Chim. (6), *21* (1905), 289.

VITACEÆ.

Wine—Detection of Fluorides Used as Preservatives.—In view of the large use modernly of fluorides for the purpose of preserving wines of weak alcoholic strength, C. Blarez recommends the following as a delicate method for their detection: Take 150 Cc. of wine, add a few drops of sodium sulphate, and then 10 Cc. of a 10 per cent. barium acetate solution, and let stand for 15 minutes. Filter through a small paper; the precipitate contains all the fluorine, together with barium sulphate and tartrate, coloring matter, etc. Wash and dry rapidly, and incinerate in a small platinum dish; moisten the ash with concentrated sulphuric acid, and

cover the dish with a waxed glass plate on which some characters have been scratched. White carnauba wax is recommended for covering the glass. The dish is then heated for an hour over a burner. It is most important to keep the glass quite cool during the heating; this is best done by passing a stream of cold water through a cylinder of the same diameter as the dish and 8 or 10 centimeters high, the bottom of which is closed with parchment. The latter fits tightly to the glass and keeps it quite cold. On cleaning off the wax the engraving can be seen with the naked eye if a fluoride has been used as a preservative. Forty or fifty millegrammes of fluorine to the liter is the usual amount present.—Pharm. Journ., April 15, 1905, 553; from Bull. Soc. Pharm. de Bordeaux, *44* (1904), 321.

Wine—Occurrence of Lecithin.—Ortlieb and Weinrich having determined the presence of lecithin in wine prepared from dry grapes on the island of Thyra, and, considering this body an essential tonic component of wines, having cautioned against the pasteurization of wines in general, as well as the heating of grape juice with the object of its preservation, because of the decomposition of lecithin at temperatures above 50° C. Dr. A. Rosenstiehl points out that the experiments of these authors have not proven the presence of lecithin in other wines than the particular kind examined by them. Moreover, while lecithin is sensitive to the influence of heat in concentrated solutions, and is liable to be decomposed at temperatures above 50° C., on prolonged heating necessary in evaporating its solutions, it is a remarkable resistant to the influence of heat in dilute solutions, such as the wine under consideration, which only contained 0.0352 lecithin in the liter. Its decomposition during the pasteurization of wines is therefore not to be feared.—Arch. d. Pharm., 242, No. 6 (Aug., 11, 1904), 475–477.

ERYTHROXYLACEÆ.

Java Coca—Alkaloidal Content of Young and Old Leaves and Assay Method.—Dr. Bloementhal has instituted comparative experiments upon the efficiency of the older method of Greshoff, proposed in 1888 for the assay of coca leaves, and adopted with slight modifications in the laboratory of the Colonial Museum at Haarlem, and the modern methods of assay proposed by Keller, Panchaud, Léger, etc., which confirm him in giving preference to the older method. Briefly, Greshoff's method consists in extracting a weighed quantity of the dried and powdered leaves at 80° with 90 per cent. alcohol, evaporating an aliquot part of the extraction, dissolving in (acidulated ? Rep.) water, shaking the filtrate repeatedly with ether, remove chlorophyl, resin, wax, etc., then rendering the aqueous solution alkaline with ammonia, shaking it out with ether, and distilling off the ether from the united ethereal solutions in a tared flask—passing a current of air dried over $CaCl_2$, over the alkaloidal residue to remove oily

drops of adhering volatile alkaloid that has the odor of tobacco. If the residual alkaloid has more than a straw-yellow color, it may be necessary to redissolve it in acidulated (H_2SO_4) water, and repeating the shaking out process—this occasioning a loss of about 0.1 per cent. less, calculated on the yield from 15 Gm. of coca. The weighing is done after drying the alkaloid for 3 hours at 95° and cooling it in an exsiccator. The recorded experiments show that *young coca leaves* contain 72 per cent. of water; air dry, they contain 8.4 per cent. of water, 6.4 per cent. of ash, and contain 2.02 per cent. of total alkaloid. *Old coca leaves* contain 59 per cent. of water; air dry, 9.1 per cent. of water, 8.2 per cent. of ash, and yield 0.78 per cent. of total alkaloid. Young coca leaves therefore contain more than twice as much total alkaloid as the old leaves, these figures being in harmony with the investigations of Eijkmann and Hartwich.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 497; from Pharm. Weekbl., 1905, 286.

SAPINDACEÆ.

Isindiyandiya—A Poisonous South-African Drug.—E. M. Holmes calls attention to a South African drug, known as *Isindiyandiya*, which has attracted attention because of fatal poisoning in a case in which it was administered to a woman by a native Zulu, in Natal, as a cure for excessive dreaming. It consisted of a bark, which was identified, in connection with a leafy twig of the plant yielding it, as being in all probability derived from a species of *Bersama*, possibly

Bersama lucens, Syzsz. On taking the leaves to the Kew Herbarium for comparison, Mr. Holmes found, however, that they were apparently identical, not with those of *B. lucens*, but with those of *B. abyssinica*, Fresen. Mr. Cheyne received the leafy twigs under the name of *Isindiyandiya* from a Kaffir doctor, who did not think it poisonous, though it produced violent vomiting. On showing these leaves and bark to two other native doctors, they gave it the same name, so that there is little doubt that the plant is that known under this name. The bark possesses characteristic styloids, which resemble those of quillaja bark, but differ in consisting of oxalate instead of sulphate of calcium.—Pharm. Journ., Dec. 17, 1904, 893.

FUMARIACEÆ.

Corydalis Cava—Alkaloidal Constituents of the Herbaceous Portion.—Dr. Otto Haars contributes the details of a comprehensive research on the alkaloidal constituents of the herbaceous portions of *Corydalis cava*. His results show that besides amorphous bases, it contains of known corydalis bases only bulbocapnine, but that it also contains two new basic bodies, having the composition $C_{21}H_{21}NO_8$ and $C_{21}H_{23}NO_7$, respectively. Protopine was not found in this herb.—Arch. d. Pharm., *243* No. 2 and 3 (April 13, and May 6, 1905), 154–165.

PAPAVERACEÆ.

Opium—Culture Experiments in Germany.—Prof. H. Thoms communicates the results of experiments made in the culture of opium from white poppy seeds in sandy, clay soil at Dahlem under conditions described in detail. The yield of air-dry opium from 100 capsules was 1.27 Gm. as an average of three experiments, or 1.11 Gm. dried in the exsiccator, assaying 6.6 per cent. of morphine. Taking into consideration the labor consumed in cultivation, collection and preparation, the production of 1 kilo of opium in Dahlem, under the described conditions, would require 40,000 poppy heads, if two incissions and collections are made, a space of 400 square meters, and 375 working hours—all in round numbers—the latter amounting to 75 marks per kilo at the prevailing cost of wages, at one-fifth mark per hour, or four times as much as the cost of the best Turkish opium. While it is possible that under more favorable conditions of soil, seed, etc., the yield of opium and of morphine content may be augmented, these experiments offer little hope for the successful commercial production of opium at Dahlem.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 812.

French Opium—Composition—Exceptional Amount of Codeine.—Lutz and Guenot have examined some opium produced by *Papaver somniferum*, cultivated in a French garden. The results showed the presence of an exceptional amount of codeine, which exceeded that of the morphine found. The figures obtained were: Moisture, 3.846 per cent.; morphine, 2.414 per cent.; narcotine, 0.109 per cent., and codeine, 2.815 per cent. —Pharm. Journ., Oct. 22, 1904, 583; from Bull. des Sciences Pharm., through Répertoire [3], *16*, 247.

Opium—Cultivation in Persia.—H. L. Robins, British Consular Agent for the Kermanshah District, communicates some interesting particulars concerning the cultivition and trade in Servian opium. The opium exported from Kermanshah via Baghdad, is either got from Nehavend, Malayer, Burujird, Luristan, or is produced locally. Opium is cultivated in the following districts and sub-districts of Kermanshah: Hirsin, Tang-i-Shohon, Bilavar, Dinavar, Duru-Faraman, Sar-Firuzabad, and in the vicinity of the town of Kermanshah. The land intended for the cultivation of opium is cleared and ploughed in autumn, and the seed is thickly sown in the month of Mizan (September 23 to October 24). The young plants show above the ground soon after the fields have been watered, and after the end of the cold season, during the months of Hamal and Saur (March 21 to May 22), the ground is manured. The plants are then thinned out, and at the end of the month of Jawz (May 22 to June 22), when the seed vessels mature, the lancing of the poppy heads begins. The lancing is done with a three or seven-bladed knife, and the following morning the juice which has oozed out of the wound is scraped off with a knife. The operation is repeated three times, the plant being allowed a day or two's

rest. The quality and quantity of the juice constantly deteriorates. In Ispahan and other places adulteration takes place by scraping away part of the skin of the poppy head, together with the juice (opium thus adulterated is named "pourreh"), but the author is assured that this does not take place in Kermanshah. Fine weather is necessary to mature the plants, but if at the time of harvest it is very hot or dry, the juice will not run so plentifully from the poppy heads, whilst through heavy showers of rain the opium may be lost. The opium is gathered in copper vessels, usually cooking utensils. The Lauristan opium, being daimi (*i. e.*, not watered), is said to be of better quality than the opium cultivated in the usual way. It is sown by the Kakavan and other Lekk tribes, whose territory borders on that of Kermanshah. The Kermanshah opium is said to be very strong, and is mostly used for local consumption. Pure opium is called "Shirreh." Good Persian opium contains 12 to 13 per cent. of morphine, but no such opium passes through Bagdad. Kermanshah opium usually contains 8½ per cent. of morphine. While the price of Persian opium in London depends chiefly on the percentage of morphine, in Hong Kong the percentage is not a great factor in the opium market. Hence Kermanshah opium has at the present time a very good name in the latter market, the adulteration which was practiced some years ago having ceased, so that 90 per cent. of the opium exported from Kermanshah to Bagdad, goes to Hong Kong and 10 per cent. finds its way to London and Egypt.—Pharm. Journ., July 23, 1904, 112.

Persian Opium—Characters and Morphine Content.—J. Schindelmeiser has subjected to chemical examination the following specimens of Persian opium: Three specimens of Mesched opium, four of Ispahan opium, and one specimen of so-called "Tschakida," a cooked or prepared opium, which is employed for eating or smoking, and mixed with hemp. Mesched opium occurs in greyish-brown shining sticks, wrapped in paper. It contains from 10 to 12 per cent. of moisture and from 5.9 to 8.71 per cent. of morphine, calculated on the dry material. No starch could be detected by the microscope. Ispahan opium also occurs in paper-wrapped shining sticks, which are brown in color. It is softer than Mesched opium and contains 18 per cent. of moisture. The dry material gave from 11.9 to 19.05 per cent. of morphine. This opium was also free from starch. Tschakida, or prepared opium, is in cakes weighing about 60 Gm.; it is dark brown, almost black, in color, and appears to be oiled. It contains 22 per cent. of moisture and only 0.38 per cent. of morphine. The practice of adulterating opium with inspissated fruit juices, such as peach and apricot juice, is said to be wide-spread in the Caucasus. Two such specimens of Caucasian opium were met with, which contained only 1.58 and 1.74 per cent. of morphine.—Apoth. Ztg., *19*, No. 84 (Oct. 19, 1904), 836.

Opium—Proposed Method of Assay for the Codex.—A. and Albert Petit, a committee appointed to report on the current methods for the determi-

nation of morphine in opium, have recommended the following process for inclusion in the next edition of the Codex: Weigh off 15 Gm. of a representative sample of the opium and 6 Gm. of slaked lime. Mix them intimately in a mortar, and carefully rub down with 150 Cc. of distilled water, and leave in contact for two hours with occasional agitation. Then throw the mixture on a filter and collect 106 Cc. of filtrate, corresponding to 10 Gm. of opium. Add to this 30 Cc. of ether, sp. gr. 0.725, and shake up well; dissolve in the mixture 2 Gm. of pure ammonium chloride, and shake until a distinct precipitate appears; set aside for 24 hours in a precipitating glass, covered with a sheet of glass to prevent too great evaporation of ether. Decant the ether on to two small counterpoised filters, add another 30 Cc. of ether to the aqueous portion, shake up, allow to separate, and again filter. Then pass the aqueous solution through the same filter so as to collect the whole of the precipitate, detaching any adherent crystals from the sides of the glass. Wash the precipitate thus collected with 25 to 30 Cc. of morphinated water by means of a sharp-pointed pipette. Dry for two hours at 100° C., then wash, on the filters, with about 20 Cc. of chloroform (previously washed free from alcohol by agitation with water), until the chloroform filtrate is colorless. Finally, dry and weigh. The morphine thus obtained should be perfectly soluble in 10 per cent. aqueous solution of potash or soda. Opium thus assayed should yield not less than 10 per cent. of morphine.—Pharm. Journ., March 18, 1905, 405; from Jour. Pharm. et Chim., (6), *21* (1905), 107.

Opium—Importance of Celerity in Morphine Assay.—Dr. G. Fromme has observed that when in morphine assays the mixture of opium solution with ammonia and ether is allowed to stand 24 hours, as is required by the Germ. Pharm., iv, the morphine is usually contaminated with a body of distinctly different crystallinity; but if the quicker, so-called Helfenberg method is resorted to, which requires the separation of the morphine separated after 10 minutes vigorous shaking, the morphine is free from the foreign crystalline matter, which will subsequently crystallize out from the filtrate. This body has been identified as being *calcium meconate*, which was obtained according to the opium sort in quantities amounting to from 0 to about 1½ per cent. The morphine separated by the quick method was uniformly found to be free from inorganic contaminants, leaving no residue on incineration, and its quantity corresponded accurately to that determined to be present by titration. On the other hand, morphine separated after standing 24 hours very often failed to correspond with the results of titration—this being doubtless due to a content of calcium meconate.—Pharm. Ztg., *49*, No. 75 (Sept. 17, 1904), 791.

Smyrna Opium—Fabrication and its Bearings on the Extract.—V. Masson states that during recent years there has been a tendency to substitute fabricated opium, standardized to contain about 10 per cent. of morphine, for the official natural product. It is stated that, in France, it is now dif-

ficult to procure a parcel of Smyrna opium consisting solely of the normal article. Among samples recently examined, one supplied as natural Smyrna opium, occurring in small, uniform, regular, spherical cakes, enveloped in a poppy leaf, was found to have the following percentage composition: Water, 14.5; extractive, 20.0; morphine in the dry opium, 10.2. From the abnormally low yield of extractive, it was expected that this would be unduly rich in morphine; but the reverse was the case. Instead of 35 per cent., which should normally have been present, it contained but 5.9 per cent.; while the extracted marc was found still to retain 5.3 per cent. of the base. The original opium was found to be alkaline in reaction, and to leave no less than 23.2 per cent. of ash. It was evidently made, either by mixing earthy matter with a rich natural opium, or compounded with exhausted opium marc, earthy matter, and added morphine. In the former case any natural salts of morphine present would have been decomposed and rendered insoluble by the calcium carbonate in the earth employed. Two other specimens examined were mixed in parcels of natural opium. One was slightly alkaline in reaction, and had the following percentage composition: Water, 9.2; extractive, 20.2; morphine, 13; ash, 5.88; morphine in extract, 22.23 per cent. The other, slightly acid in reaction, gave: Water, 8.31; extractive, 27.8; morphine, 12.19; ash, 5.71; morphine in extract, 29.96 per cent. These two specimens are characterized by their relatively high yield of morphine and poor yield of extract. Only the morphological elements of natural opium could be found in the marc. They appear to consist of mixtures of natural opium, poppy capsules and poppy-leaf debris, and added morphine. A typical fabricated opium, sold as such, standardized to 10 per cent. of morphine, but without guarantee for extractive, occurred in small, soft cakes of dark color and homogeneous consistence, without any apparent vegetable débris. It was acid in reaction, contained 19.11 per cent. of moisture, 44.52 per cent. of extractive and 10.66 per cent. of morphine, with 18.67 per cent. of morphine in the extract. Another specimen of a similar kind, but guaranteed both for morphine and extractive, contained 10.12 per cent. of the former, 57.3 of the latter, and only 12 per cent. of morphine in the extract. This extract was abnormal in consistence, being gummy and elastic, and evidently contained added gum. It is evident that with these fabricated opiums, although they may be correctly standardized for morphine content, the ratio between morphine and extractive and the amount of morphine present in the extract prepared from them differs widely from that of natural opium.—Pharm. Journ., June 17, 1905, 875; from Journ. Pharm. Chim. (6), *21* (1905), 529.

CRUCIFERÆ.

Black Mustard Seed—Content of Volatile Oil and Substitution by Other Allied Seeds.—In their very exhaustive paper on Mustard seeds, running

through several numbers of the "Apotheker Ztg. (Nos. 18–21 inclusive, 1905), C. Hartwich and A. Vuillemin enumerates the following species of *Brassica* and *Sinapis* as composing wholly or in part the black mustard seed of commerce: Sometimes the official (G. P.) seed of *Brassica nigra* alone (Turkish, Dutch, Sicilian, Alsatian, Italian), but more often of mixtures of *B. nigra* and *B. rapa* (Italian, German), *B. rapa* and *B. arvensis* (Russian, Roumanian), *B. nigra*, *B. rapa*, and *B. arvensis* (Italian), *B. juncea* and *B. rapa* (Sarepta), *B. nigra*, *B. juncea*, and *B. rapus* (Indian), *B. nigra* and *juncea* (Bombay), or *B. juncea* alone (Indian), Russian and Thurgan mustard consisted of the seeds of *B. arvensis;* Persian, Yamba and Cawnpore of *Eruca sativa;* Japanese and Chinese of *S. cernua;* Java, Guzerat, yellow rape and Sommeani rape of *S. glauca*, and Cawnpore rape of *S. dichotoma*. The examination of a number of commercial samples of black mustard seeds showed that they yielded from 0.05 (*Sinapis dissecta*) to 1.17 per cent. of volatile oil, when subjected to Vuillemin's method of estimation.—Pharm. Journ., June 10, 1905, 845.

Powdered Black Mustard Seed—Detection of Sinapis Alba and S. Arvensis.—In the above-mentioned paper the author gives a description of the microscopic structure of the mustard seed,

Brassica Nigra, of the German Pharmacopœia, accompanied by a key for the identification of the seeds of allied species of *Sinapis* and *Brassica* that are frequently found in admixture. The presence of *Sinapis alba* or *Sinapis arvensis* in commercial powdered mustard is easily detected by the following test: 5 to 10 Gm. of the powder to be examined are mixed with 30 Cc. of water, and after a few minutes filtered. To the filtrate freshly-prepared Millon's reagent is added and the whole gently warmed. If any seed containing sinalbin (*e. g.*, *S. alba* or *S. arvensis*) is present the precipitate will be reddish-brown in color and the supernatant liquid blood-red; if sinalbin is absent the supernatant liquid will be colorless. The seed of *S. arvensis* may be distinguished under the microscope from *S. alba* by warming with chloral hydrate, when the palisade layer will acquire a fine red color (*S. arvensis*). The investigation with Millon's reagent had shown that in the presence of myrosin from the seeds of *S. alba* the supernatant liquid assumed a rose-red color, whereas with myrosin from *B. nigra* it remained colorless, hence the two myrosins cannot be identical. A similar difference characterizes sinigrin and sinalbin, and it is upon this that the test for the seeds of *S. alba* and *S. arvensis* previously described depends.—Pharm. Journ., May 20, 1905, 719; from Apoth. Ztg., *20*, No. 18 (Mar. 4, 1905), 162.

Ground Mustard—Standard.—In view of the fact that starch is foreign to pure mustard, and that copper-reducing materials, other than starch, exist in mustard-hulls under the diastase treatment, it is suggested by A E. Leach that any standard should rule out more than mere traces of

starch, as shown by the microscope. Based on a number of analyses, the following standards are suggested for ground mustard, expressed in a moisture-free and fat-free substance: Reducing material by diastase treatment should not exceed 2.5 per cent. expressed as dextrose; crude fibre should not exceed 5 per cent.; and total nitrogen should not be less than 8 per cent. As shown by microscope, the sample should be free from more than minute traces of starch, and should not exhibit an excess of hulls over seed tissue.—Journ. Amer. Chem. Soc., 1904, No. *10*, 1203.

Mustard—Stability of the Powder.—J. W. Hamma records the details and results of experiments undertaken for the purpose of determining the conditions under which powdered mustard is subject to unfavorable change on keeping. His results lead to the conclusion that powdered mustard is quite stable, keeping unchanged for more than a year provided it is protected from heat.—Pharm. Ztg., *49*, No. 81 (October 8, 1904), 865; from Svensk Farm. Tidskr., 1904, No. 16.

Mustard—Detection of Artificial Coloring.—According to P. Bohrisch table mustard is not infrequently artificially colored, aniline dyes or turmeric being commonly used, and he recommends the following tests for their detection: 1. Mix 20 Gm. of the mustard with 100 Cc. of alcohol, heat on a water-bath for half an hour and filter whilst hot; to 50 Cc. of the filtrate, which is of a dark yellowish-brown color even if the mustard is uncolored, add 10 Cc. of a 10 per cent. solution of potassium bisulphate, heat to boiling, and immerse in the liquid a woolen thread; after ten minutes remove and wash first with water and then with 10 per cent. ammonia. If aniline color is present the wool will show a pure lemon-yellow color both before and after washing with ammonia. With genuine mustard at most a brownish coloration may be observed on the wool after washing with water. 2. 10 Gm. of mustard are mixed with 30 Cc. of absolute alcohol and filtered off after twelve hours; in the solution suspend strips of filter paper, dry the strips and moisten the yellow band they will exhibit with solution of boric acid; if turmeric is present the characteristic red reaction will be observed.—Pharm. Journ., October 1, 1904, 477; from Ztschr. f. Untersuch. Nahrungs. u. Genussm., *8*, 285.

BIXINEÆ.

Gynocardia Seeds—Hydrocyanic Acid an Important Therapeutic Constituent.—Greshoff expresses the opinion that hydrocyanic acid plays an important roll as an antiseptic and bactericidal constituent of gynocardia seeds, and has redetermined the percentage contained in them. He finds that even the dried, freshly-powdered seeds have a strong odor of hydrocyanic acid. When extracted with petroleum ether, this yields about 40 per cent. of fixed oil—the so-called chaulmoogra oil—which contains *no* hydrocyanic acid. But from the press-cake, deprived of oil, 0.92 per cent. of hydrocyanic acid was obtained, the original seed containing 0.80 per

cent., and he considers it quite probable that the *fresh* seeds contain at least 1 per cent. of hydrocyanic acid. This leads to the conclusion that the fish poison, as well as the ointment of gynocardia, were advisedly prepared from the powdered seeds, as required for the latter by the old Bengal Pharmacopœia, and not from the expressed oil. By age the seeds appear to lose their hydrocyanic acid content.—Pharm. Ztg., *50*, No. 19 (Mar. 8, 1905), 198; from Pharm. Weekbl., 1905, No. 5.

HAMAMELIDACEÆ.

Burmese Storax—Characters.—Storax is produced in Burmah by a large tree growing in the forests of the Indian archipelago, the *Altingia excelsa*, which frequently reaches a height of 150 to 180 feet. This storax has long been used as an incense and also medicinally. Hooper has recently examined two aromatic exudations from this tree, one of which was a soft, white crystalline balsam, the other a dark brown solid balsam. The former resembled honey when fresh, but after two years crystallized, became white and had a fragrant odor of styrol. It melted at 41° C., and when heated on the water-bath lost 7.65 per cent. in weight, the volatile substances being chiefly essential oils. About half the balsam consisted of an ester of cinnamic acid, the amount of the latter separated being 37 per cent. calculated on the original balsam. The brown solid balsam consisted of resinous masses, which yielded a brown powder with an aromatic odor in which that of cinnamon predominated. The brown balsam contained a trace of free cinnamic acid and 9.7 per cent. of cinnamic acid in the form of an ester. From the author's investigation he concludes that the white balsam is valuable as a source of cinnamic acid, and the brown balsam is of value as a perfume and incense. Both possess a sweeter aroma than genuine storax, and when heated with sulphuric acid and potassium dichromate both evolve an odor of benzaldehyde. The author's results confirm the statement of Tschirch and Van Itallie that this resin differs in constitution from the genuine storax of Asia Minor.—Pharm. Era, Dec., 1904, 579; from Jour. Soc. Chem. Ind.

MYRTACEÆ.

Eucalypti—Review of Several Species.—The fifth part of J. H. Maiden's "Critical Review of the Genus Eucalyptus," recently issued, includes *E. stellulata*, *E. coriacea* and *E. coccifera*. In these the younger leaves have a more or less orbicular outline, whilst the older leaves become more or less lanceolate, often with hooked tips, and the flowers are practically sessile on the peduncles, without pedicels. The following synonyms are given for each, viz.: (1) *E. stellulata*, Sieb., now includes *E. leucadendron*, A. Cunn., var. *angustifolia*, Benth., *E. microphylla*, A. Cunn., in part, *E. Cunninghamii*, Sweet, in part, and *E. Cunninghamii*, G. Don, in part. (2) *E. coriacea*, A. Cunn., includes *E. parviflora*, Sieb., *E. piperita*, Sm., var.

pauciflora, D. C., *E. submultiplinervis*, Miq., and *F. minor*, Miq., *E. sylvicultrix*, F. v. M., and *E. phlebophylla*, F. v. M. (3) *E. coccifera*, Hook. f., includes *E. alpina*, R. Br. MS., *E. daphnoides*, Miq., *E. citryandra*, Vilmorin (?), and *E. pinnata* (?). It may be noted that *E. coccifera* is a hardy species, succeeding in many parts of the United Kingdom. It is interesting to read also that the glaucous character of the leaves varies a good deal according to the season of the year. Specimens of *E. Andrewsii* received by Maiden in October were dull and glaucous, whilst those received in June had a shining surface.—Pharm. Journ., Febr. 11, 1905, 193.

Eucalypti—New Species.—Mr. Maiden also describes four new species of *Eucalyptus*, being apparently largely guided by the character of the young leaves. Of these new species, *Eucalyptus seeana* is presumably the plant named *E. tereticornis*, Sm., var. *linearis*, by Baker and Smith in their "Research on the Eucalyptus" (p. 74), the second, *E. Deanei*, was formerly called *E. saligna*, Sm., var. *parviflora*, Deane and Maiden, and the third, *E. Andrewsii*, is nearly allied to *E. regnans*, *E. piperita* and *E. dives*; the fourth, *E. Consideniana*, is nearly allied to *E. stricta* and *E. fastigiata*, Deane and Maiden. The last is especially interesting, from being named in honor of First Assistant Surgeon D. Considen, one of the founders of Australia, and apparently also the founder of the eucalyptus oil industry.—Pharm. Journ., Febr. 18, 1905, 235; from Proc. Linn. Soc., N. S. W., 1904, 469.

Mallet Bark—A Valuable Tan-Bark Derived from a Eucalypt.—E. M. Holmes calls attention to a specimen of "mallet bark" recently presented to the museum of the Brit. Phar. Society by Mr. Percy Appleyard, of Albany, W. Australia, accompanied by dried flowering specimens of the plant, which establish beyond a doubt that this valuable tan-bark is derived from

Eucalyptus Occidentalis, Endl., the local or vernacular name of which, in Albany, is the "mallet tree." In "Der Gerber" (Dec. 15, 1904, 349), the botanical source of this bark is referred to *Jasminum sambac*—doubtless an erroneous information—and an analysis of the bark, collected at various periods is given, showing the following percentages of tannin available for leather manufacture: Young bark, 35 per cent.; medium bark, 40 to 50 per cent.; old bark, 39 to 70 per cent., giving an average of about 38 per cent.; but Mr. Appleyard gives 30 per cent. only as the average of the bark sent by him. A specimen of the powdered bark was analyzed by Professor H. R. Procter, however, gave 54.5 per cent. of tanning matter absorbed by hide, together with 8.0 per cent. of soluble non-tanning matter, 25.3 per cent. of matter insoluble in water, and 11.6 per cent. of water. This leaves no doubt that mallet bark is one of the strongest natural tanning materials available, but there appears to be some doubt

as to the best method of using it. When used alone it is said to make hard, thin and brittle leather.—Pharm. Journ., Febr. 4, 1905, 141.

Syzygium Jambolanum—Method of Use in Diabetes.—The failure of the two jambul preparations—artimellin and djevat—to produce the expected therapeutic results in the treatment of diabetes, leads M. Dapper to recommend a preparation of the entire jambul fruit, made according to the following formula and process supplied by v. Noordin: 200 Gm. of the fruits, including the seeds, are finely powdered, and macerated in 2 liters of water, to which 10 Gm. sodium chloride and 4 Gm. salicylic acid has been added, for 24 hours at incubator temperature with frequent agitation and careful avoidance of higher temperature. The liquid is then filtered, keeps well in cool weather, and is administered in doses of 100 Cc. morning and evening, a supply of 2 liters thus for 10 days. It is significant that the author warns against placing too great reliance on this use of jambul for the treatment of diabetes, and that he regards the conscientious observance of the diabetic regime, decided upon in accordance with the individual conditions, to be of paramount importance.—Pharm. Ztg., *49*, No. 64 (Aug. 10, 1904), 675; from D. Med. Wschr., 1904, No. 32.

Djamboe Leaves—Constituents.—A. Altan has determined the following constituents in the leaves of

Psyidum Goyavo (Djamboe Leaves): 3.15 per cent. of resin, 5.99 per cent. of fat, 0.365 per cent. of essential oil, and 9.15 per cent. of tannin, besides chlorophyll, cellulose and ash. The essential oil has the sp. gr. 1.069, and contains eugenol.—Pharm. Journ,, Nov. 26, 1904, 773; from Bull. d. Pharm. de Bruxelles, *48*, 193.

ROSACEÆ.

Roses—Revised Classification.—J. G. Baker suggests that the roses should be divided into three groups. In the first group primary species are enumerated; in the second, subspecies and varieties; in the third, the principal hybrids. The primary species as estimated by the author are sixty-nine in number, and they are classified under eleven groups, which may be briefly diagnosed as follows: 1, Simplicifoliæ, with simple, exstipulate leaves; 2, Systylæ, with styles protruded beyond the disk as a united column; 3, Banksianæ, with free, deciduous, linear stipules; 4, Bracteatæ, with adnate stipules, having fruits and prickles in infrastipular pairs; 5, Microphyllæ, like the last, but the fruit glabrous, with a thick green pericarp; 6, Cinnamomeæ, like the last, but the fruits red and glabrous, with a thin pericarp; 7, Spinosissimæ, prickles very unequal, never in stipular pairs; 8, Gallicanæ, like the last, but prickles slightly unequal, with leaflets coriaceous and rugose; 9, Caninæ, prickles equal, not in stipular pairs, leaves glabrous or slightly pubescent; 10, Villosæ, like the last, but leaves very hairy; 11, Rubiginosæ, like the last, but

leaves very glandular beneath.—Pharm. Journ., Mar. 11, 1905, 367; from Proc. Linn. Soc., Febr., 1905.

Rosa Gallica—Isolation and Characters of the Coloring Matters.—The petals of *Rosa gallica*, having been the subject of investigation by chemists from time to time with varying results, W. A. H. Nayler and E. J. Chappel have engaged in a reinvestigation and communicate preliminarily the results obtained with the two coloring matters previously described by other authors—the one a yellow coloring matter, believed by Filhol to be quercitrin, the other a red coloring matter, which had been obtained by Senier a number of years ago. The yellow coloring matter proved to have the empirical formula $C_{15}H_{12}O_5$, but all attempts to hydrolyze it, or to obtain an acetyl derivative from it, failed, and it is therefore not quercitrin, as believed by Filhol, differing also from the latter in giving an orange-red precipitate with lead acetate, and in not fusing at 135° C.—a much higher temperature being required. The red coloring matter of Senier, proved to be amorphous, deep red, and soluble in water and alcohol, the solutions being deepened in color on the addition of dilute sulphuric acid; but its solution did not effervesce with sodium carbonate, and all attempts to obtain crystalline salts of the alkalies, as described by Senier, failed; nor was it possible to induce the red substance itself to assume a crystalline form. Further and more extended examinations of the two coloring matters are being made, for which purpose the authors are engaged in their preparation of larger quantities.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 475–479.

Cliffortia Linearifolia, E. and L.—A Rhodesian Remedy for Dysentery.—E. M. Holmes has identified a plant, used in Rhodesia as a remedy for dysentery, to be a species of

Cliffortia near C. linearifolia, E. and L., if not merely a form of that plant. Like many of the plants of the Rosaceæ, it possesses astringent properties, which accounts for its use by the natives. In Matabeleland it is known as "Hlatu matyeni," and in Mashonaland as "Gava makee," the latter name meaning "growing on stones," since it grows in rocky crevices of granite. The plant is used in form of decoction. An allied species,

Cliffortia ilicifolia, is mentioned in Pappe's "Fl. Med. Capensis" (p. 12) as being used by the Boers as an emolient and expectorant remedy for coughs, by whom, on account of the spines, it is called "Dornthee."—Pharm. Journ., Dec. 17, 1904, 894.

Geum Urbanum—Odor Developed by the Reaction of an Enzyme with a Glucoside.—A freshly dug, intact root of *Geum urbanum* is, as is well-known, odorless, but develops a clove-like odor when it is ruptured by attrition between the fingers. The investigations of E. Burquelot and H. Herissey have now established that, as in the case of cherry laurel leaves, this characteristic odor is developed by the influence of an enzyme upon

a glucoside, both of which have been isolated and characterized by them. The sliced roots were treated with boiling 95 per cent. alcohol, in the presence of calcium carbonate, added to neutralize any vegetable acids that might hydrolyze the glucoside, and from this alcoholic extraction the glucoside was subsequently obtained in a practically pure condition. Another portion of the roots was extracted with cold alcohol, which removed the glucoside, but left the enzyme in an unchanged condition in the plant substance, whereas, in the portion treated with boiling alcohol, the enzyme was necessarily destroyed. On pulverizing the root after extraction with cold alcohol and drying, and adding a portion of the odorless mixture of the powder with water to an equally odorless aqueous solution of the glucoside, obtained as described, the odor of cloves was developed in a short time. Further investigation proved that the glucoside splits off sugar and a body resembling eugenol. This body was also isolated, and found to be crystalline, and to have the same melting-point (68°–69°) at which pure benzoyl eugenol melts.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 498; from Jour. de Pharm. et Chim., 1905, 481.

LEGUMINOSÆ.

Acacia Farnesiana, Willd.—*Profuse Occurrence in Cuba.*—It is stated in the "Journal d'agriculture tropicale" [*4* (1904), 334], that *Acacia Farnesiana*, Willd., which yields the oil of cassie blossoms, is now found in Cuba (where it is called "Aroma francesa") in such quantities, that in some parts of the island it has become a veritable plague. All methods of extermination have hitherto failed, so that the idea of utilizing the shrub for technical purposes cannot be rejected. Apart from the blossoms which yield the well-known fine perfume, the wood is said to be useful for wheelwright's work and for furniture. It is reported that in New Caledonia, where the situation is the same as in Cuba, it is intended to work up the bark and the shoots for tannin in which they are very rich.—Schimmel's Rep., April–May, 1904, 21.

Mimosa Flowers—Use of Coloring Matter for Detecting Boric Acid.—In a previous paper (see Proceedings, 1904, 722), L. Robin stated that the yellow tincture of mimosa flowers might be used as a delicate indicator in alkalimetry. Its use is now advocated either in the liquid form or as test-paper, for the detection of boric acid. The paper is best prepared from the tincture diluted with a fourth part of distilled water. It should be kept from the light, after drying at 100° C. To detect boric acid in a mixture of salts a few drops of the solution, previously rendered alkaline with sodium carbonate and filtered, are added to one drop of the mimosa tincture in a white porcelain capsule, then just sufficient hydrochloric acid to discharge the yellow color is added, and the mixture is evaporated to dryness on a water-bath. If boric acid be present, the residue will be yellow in color, turning red on adding a few drops of 10 per

cent. sodium carbonate solution. In the absence of boric acid the residue is greyish and becomes yellow on adding the carbonate solution. If only traces are suspected the test-paper should be used. The alkaline filtrate of the salts is acidified with hydrochloric acid, evaporated to a small volume, into which a strip of test-paper is then immersed, and evaporation continued to dryness. The dry paper will be yellow, turning red when moistened with sodium carbonate if boric acid be present. In wines and other beverages the test is applied to the aqueous solution of the ash from 10 Cc. of the liquid. With milk, .15 Cc. to 20 Cc. is coagulated with acetic acid, filtered, neutralized with sodium carbonate, using phenolphthalein or mimosa tincture as indicator, boiled, again filtered, the filtrate evaporated, calcined, and the test applied as above to the solution of the ash.—Pharm. Journ., Nov. 26, 1904, 773; from Annales de Chim. Analyt., *9*, 3369.

Gum Arabic—Detection in Powdered Tragacanth.—E. Payet recommends a method for the detection of gum arabic in powdered tragacanth, which is dependent on the presence of oxydases in gum arabic and their absence in tragacanth. A solution of the suspected powder (1 : 30) is prepared with cold water, mixed with equal volume of a 1 per cent. aqueous solution of guaiacol, and a few drops of hydrogen dioxide. In the presence of gum arabic a brown color, due to the oxydases, is developed, whereas a solution of tragacanth remains colorless under this treatment.—Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 652; from Rép. de Pharm., 1904, No. 7.

Persian Tragacanth—Commercial Qualities.—According to the British Consular Agent for the Kermanshah district there are four principal qualities offered for sale in the Kermanshah market. The *first quality* is received from Burujird, Nehavend and Kermanshah, and is obtained from the plant known as "Gavan-sefid," or white gavan, by incisions, from which the gum exudes. The *second quality* is received from Kurdistan, Kermanshah, Nehavend and Burujird, and is obtained from the yellow gavan, which is a larger plant than the gavan sefid. The top of the plant is burnt, and when the leaves are all consumed the fire is put out and incisions are made. The following morning the gum is collected, this operation being repeated three or four times, the quality improving each time. The *third quality*, known in Persia under the name of "Arrehbor," is obtained from Mount Dalahu, Pusht-i-Ku, Khorremabad and Burujird. It exudes from the branch of a small tree, the top of which has been burnt and the branches then cut *with a saw* (hence its name, "Arrehbor"). The branches are cut three or four times. The *fourth quality*, or stone gum, which is known under the name of Kurreh (Kora), is obtained from the same regions as the third quality, and in the same way, but this quality deteriorates after each renewal of the treatment. The indiscriminate and reckless method of collecting the gum, although the tragacanth fields are

numerous and extensive, will doubtless soon cause the supply of these gums to diminish.—Pharm. Journ., July 9, 1904, 40.

South American Gums—Two New Sorts.—Dr. Dominquez describes two new gums of South American origin, one of which, under the name of "*Gomme brea*," has recently been received at Dunkirk. This appears to be derived from *Cæsalpinia præcox*, R. and R., a tree found in several provinces of Brazil. The gum occurs in stalactitic pieces or in oval tears, isolated or agglomerated, of a reddish-yellow color. Its specific gravity is 1.537 to 1.560 for the stalactitic form, and 1.580 to 1.650 for the agglomerated tears. In water it first swells and then dissolves. The solution is viscous, of acid reaction, and of a pale reddish-yellow color, which is partially decolorized if the mucilage is heated on a water-bath with a few drops of hydrochloric acid. The solution is levogyre —0.20. The gum contains 77 per cent. of arabin, and the ash consists of lime, magnesia, potash, and traces of iron. The second gum is described by Dr. Dominguez under the name of

"*Cebil*," which is produced by *Piptadenia cebil*, Griseb. (*Cebil colorado*). This gum occurs in tears, like those of gum Senegal, or in angular masses, the latter being usually darker colored, and containing bark and soil. Good samples consist of tears of about 1 Gm. to 10 Gm. in weight. They are reddish-yellow, cracked superficially, and usually have a central cavity. This gum swells in water and then readily dissolves. The mucilage is of a reddish-yellow color, viscous, odorless, insipid, and of acid reaction. The specific gravity is 1.482, and it is dextrogyre +0.59. It yields 80.78 per cent. of arabin. Both gums give precipitates with alcohol and subacetate of lead, but not with the acetate nor with borax. From gum arabic these gums differ in yielding less mucic acid and galactose when treated with nitric acid, but with hydrochloric acid nearly twice as much furfurol and arabinose, being exceeded in this particular only by the gum of *Piptadenia rigida*, Benth, which yields three times as much arabinose as gum arabic, more than twice as much furfurol. These gums can be obtained from the province of Tucuman.—Pharm. Journ., Aug. 6, 1904, 178; from Datos Para la Materia Medica Argentina, *1*, 91–103, through Rev. des Cult. Colon, *14*, 314.

Lupinus Perennis—Alkaloidal Constitutents.—See *Oxylupanine* under "Organic Chemistry."

Java Indigo—Characters of Yellow Coloring Constituent.—The yellow coloring matter shown by Rauson to be a constituent of Java indigo, has been investigated by A. G. Perkin, who finds that this substance, $C_{15}H_{10}O_6$, forms yellow needles, melts at 276–277°C, and gives an acetyl compound, $C_{15}H_6O_6(C_2H_3O)_4$, which separates in colorless needles and melts, when crystallized from methyl alcohol, first at 116–120° and subsequently at 181–182°C. The coloring matter is identical with kampherol.—Pharm. Journ., July 9, 1904, 43; from Proc. Chem. Soc., *20*, 172.

Bastard Logwood—Chemical Distinction.—For some years past a variety of the logwood tree, known to the residents in Jamaica under the name of "bastard logwood," appears to have been on the increase, and a study of the tree and conditions under which it grows was made on that island by Professor T. S. Earle (see Proceedings, 1904, 726). The chips of this tree present a yellow, pink, white, or even chocolate colored surface, instead of a dark red or deep purple bronze tint, like the best Jamaican or Mexican logwoods. There is practically no distinction to the eye between the bastard and genuine trees, and even the seedlings of the red and bastard logwood are not distinguishable. The color of the heartwood does not depend upon disease, soil, or climatic conditions, as bastard and normal trees are found growing side by side, nor is it the result of immaturity. The logwood tree appears to be a very variable one, showing differences in form, color, and texture of leaf, time of blooming, form, and extent of the ribs on the trunk, color of the bark, and especially in the color and dye-producing quality of the heartwood. Analyses of the heartwood of the red, blue, and bastard logwood trees have been made by B. C. Gruenberg and W. J. Grès with the view of ascertaining whether chemistry would reveal any reason for the different yield of coloring matter in these varieties, but it was found that the chemical differences between the red logwood and the bastard kind were very slight, and probably the lower carbon content of the bastard wood might be attributed to deficiency of hæmatoxylin, which contains nearly twice as much carbon as oxygen. Extractions with various solvents indicated the presence of at least two pigments in varying proportions, or of a pigment radical in different combinations, as the order of coloration intensity was altered by diluting with water. Aqueous extracts of the two varieties of logwood (red and bastard) gave different reactions by acids, alkalies, and other reagents. The differences are parallel to those between a fresh aqueous solution of commercial logwood extract and the same solution after it had become discolored on long standing. Specimens of the flowers of the different varieties examined by Mr. W. Fawcett showed that the blue logwood has wider petals and thicker pistils than the red and bastard. In the bastard kind the petals are the narrowest of the three, the style is slightly curved; in the other two the stamens are smaller, and there is less difference between them.—Pharm. Journ., Jan. 14, 1905, 37; from Bull. Dept. Agric., II, 241–250.

Amorpha Fructicosa, L.—Volatile Oil of Leaves and Fruit.—According to Vittorio Pavesi, *Amorpha fructicosa*, L., an ornamental shrub frequently found in European gardens, contains distinct oils in the leaves and fruit. The latter yields from 1.5 to 3.5 per cent. of oil on distillation with water vapor, the leaves from 0.5 to 0.8 per cent. of an oil of a bright color and bitter taste, containing a terpene in the lower boiling portion, while the higher boiling portion of the leaf oil contained some, besides cadinene, but

as principal constituent a sesquiterpene, which approaches in its qualities clovene—the companion of cadinene, discovered by Wallach—or which may possibly be regarded as a new sesquiterpene, for which the author proposes the name "amorphene."—Schimmel's Rep., Oct.–Nov., 1904, 9; from Annuario della Soc. Chim. di Milano, *11*, 4.

Tamarinds—Cultivation in Lower California.—During a visit to Lower California, Prof. John Uri Lloyd had opportunity to get some information concerning the cultivation of the tamarind tree, which appears to thrive well in the open air without any care whatever, being grown largely as an ornamental tree at the door-yard and in parks, as well as for its fruit. The tree, as found in and about La Paz, is about as large as a medium-sized honey locust, resembling it so nearly in leaf as to at once remind one of that familiar Northern tree. In addition, it bears a pod, which, however, resembles the "honey shuck" only in that it is a pod, for it is chubby short and greenish-brown, as found at this date (February), nearly matur on the tree. This pod is the tamarind fruit, and yields "tamarinds" as found in commerce. In size the tamarind pod is from one to four inches long, about an inch wide, and one-half inch thick. It is green, but covered with a nut-brown scale which easily rubs off, exposing the green bean. Bisected, we find a pulp covered with a thin shell, which encloses the seed. The varying number of seeds, from one to four, governs the length of the pod. All parts of this pod are sour, and the leaf of the tree is also sour to the taste. When the pod ripens, the pulp enclosing the seed shrinks from the brown shell, which is easily removed. The natives keep the ripe pod from season to season, and, as required, make a refreshing drink by steeping the pulp in cold water, having first removed the shell. When tamarinds are exported they are deprived of their shells, the massed pulp containing the seeds being pressed into barrels or other convenient containers, and thus appear in commerce.—Midland Drugg., Sept., 1904, 24.

White Balsam of Peru—Composition.—Thoms and Biltz have completed a chemical examination of the white balsam of Peru described in the report of Gehe & Co. several years ago (see Proceedings, 1902, 881), and have determined the following components, which are fully described in their original paper: Myroxocerin, free cinnamic acid, a crystalline body (m. p., 270°), myroxol, the cinnamic acid ester of cinnamyl-phenyl-propyl alcohol, and, in all probobility, a hydrocarbon. The important constituents of black balsam of Peru, benzyl alcohol and peruviol were not found in the white balsam.—Pharm. Ztg., *49*, No. 83 (Oct. 15, 1904), 884; from Ztschr. d. Œsterr. Ap.–V., 1904, No. 37.

White Balsam of Peru—A Variety from Honduras.—Tschirch and Burckhardt have examined a white balsam of Peru from Honduras, which they regard as distinct from the true white balsam of Peru obtained from the fruits of *Myroxylon Pareira*. It is doubtful also whether it is identical

with the white balsam of Peru, recently described by Thoms and Biltz (which see above). It contains besides cinnamic acid, a resin-ester of cinnamic acid with a colorless, solid resin-alcohol, having the character of storesinol, and a mixture of liquid resin-esters of cinnamic acid with alcohols, which will be described and characterized hereafter. The balsam, in fact, has a remarkable resemblance to storax, possessing also the odor of the latter substance.—Schweig. Wschr. f. Chem. u. Pharm., *43*, No. 18 (May 6, 1905), 238.

Surinam Copaiba—Composition and Characters of Different Samples.—L. van Itallie and C. H. Nieuwland have examined seven samples of Surinam copaiba. The examination shows that this kind of copaiba occurs as yellowish or brownish-yellow fluid, of varying consistence, from a thin to a thick liquid. The specific gravity ranged from 0.9066 to 0.9611; the acid value from 14.65 to 59.19; ester value from 9.7 to 18.21, and the amount of volatile oil from 41 to 71.6 per cent. It is, therefore, like other copaibas separable into two classes, thick and thin. It is not soluble in five volumes of absolute alcohol; neither in equal volumes, nor in twenty volumes of 90 per cent. alcohol; soluble in chloroform, petroleum ether, and in ether, and dissolved in carbon disulphide with a slight turbidity. It forms an emulsion with one-third its volume of 10 per cent. solution of ammonia, from which on standing oily drops separate. When shaken with chloral hydrate solution, and allowed to separate, the lower resin solution does not acquire a characteristic color like gurjun balsam. One drop of Surinam balsam, dissolved in 1 Cc. of acetic anhydride, gives a fine blue color on the addition of a drop of sulphuric acid. Maracaibo balsam does not give this blue color-reaction. The essential oil contains two sesquiterpenes, one lævo- the other dextro-rotatory, and a sesquiterpene alcohol, $C_{15}H_{25}OH$, which occurs in colorlesss and odorless crystals, m. p., 113.5–115° C., which begin to sublime at 80° C., with decomposition. The oil also contains a little cadinene.—Apoth. Ztg., *19*, No. 82 (Oct. 12, 1904), 816; from Pharm. Weekbl., No. 40, 1904.

African Copaiba—Purification and Properties.—C. M. Kline, after calling attention to the ill-repute of "African Copaiba" on account of its undoubted use as an adulterant of certain essential oils and of Central American copaiba, speaks a good word for it, the more particularly since if it were introduced into the American market under its true name as a therapeutic agent, which it is not, it would probably be found quite as efficient as the more expensive American balsams—for there seems little doubt that this product is derived from a true species of *Copaiba*. As found upon the market in the crude state, this

African "Balsam" is a thick, strong-smelling liquid containing over 10 per cent. of water and dirt. This water is very difficult to separate, as the specific gravity of the copaiba (0.9916 to 0.9996) combined with the viscosity of the liquid prevents the settling out of much of the water, while

the mixture is so thick that it will not in the cool state run through a filter. Recourse is therefore had, in the laboratory of the author's firm, to a system of hot funnel filtration, the source of heat being steam at a low pressure, each funnel having a capacity of about one gallon, and a series of them enclosed in a box from which the stems protrude and through which the steam is caused to pass. By this means, filtration is rapid, the water being afterwards separated by heating the united filtrates in a jacketed kettle for some time at a temperature below the boiling-point of water, which causes the settling of the water to the bottom of the vessel, whence it is withdrawn by a tap. The purified copaiba so obtained is of a dark brown color, with a reddish tinge, and has an odor very different from the other copaibas. On standing for some time it deposited crystals of what appeared to be oxycopaibic acid. On distillation it yielded 43.5 to 45.5 per cent. of volatile oil, of a yellow color, which when redistilled had a sp. gr. at 15° C. of 0.928, and an optical rotation—5° 45′.—Proc. Penna. Pharm. Assoc., 1904, 176–178.

Copaiba—Modification of the Proposed "Resin-Factor."—At the meeting of the Brit. Pharm. Conference, 1900, E. Wightman Bell read a paper on copaiba and described a "resin-factor," obtained by dividing the resin-percentage by the saponification-nnmber of the balsam. S. Judd Lewis now suggests that the relation may be more satisfactorily expressed by dividing the saponification-number by the resin-percentage and by multiplying by 100. Neglecting the small saponification-number of the volatile oil, the number so obtained is the saponification number of the resin. Three oleo-resins were examined with the object of demonstrating this practically, but, unfortunately, no opportunity of continuing the experiments for some time to come is anticipated. Although the resu ts were not conclusive, Sample A holds out some hope; and they are instructive to this extent, that the relative genuineness of the samples as shown by other considerations is borne out by the more or less close agreement of the saponification-numbers obtained by Method (*a*)—calculated for the resin from the figures obtained for the balsam—with those obtained by Method (*b*)—by direct experiment on the separated resin, carefully freed from essential oil. The results are given for the resin as follows:

	Acid Number.	Ester Number.	Saponification Number.
Sample A (*a*)	148.3	25.2	173.5
Sample A (*b*)	143.8	35.4	179.2
Sample B (*a*)	140.8	14.55	155.35
Sample B (*b*)	129.62	32.77	162.39
Sample C (*a*)	153.7	28.2	181.9
Sample C (*b*)	145.1	21.9	167.0

Sample A is genuine, Sample B probably not genuine, Sample C undoubtedly sophisticated. The saponification-numbers of the essential oils separated were: Sample B, 1.04; Sample C, 2.30.—Chem. & Drugg., Nov. 5, 1904, 778.

Copaiba—Tests.—Prof. L. E. Sayre reviews the various tests that have been proposed for the identification and quality of the different copaibas, quoting liberally from Dr. Dieterich's work on balsams and gum resins. He observes that the U. S. P. is in error when it states that when the volatile oil has been completely driven off from the copaiba the residue should be friable. There are certain varieties of copaiba which will yield as residue a soft resin.—Drugg. Circ., Aug., 1904, 165–166.

Gurjun Balsam—Method of Collection in Cochin-China.—From a treatise on gurjun balsam (l'hail de bois) obtained from *Dipterocarpus* species, in Reone de Droguerie, the following interesting facts related to the collection and properties of this important article is abstracted: In the spring of the year a deep slit is cut in the trunks of the trees at an angle of 45°, and a wide cavity is made, into which the vessel for collecting the balsam is placed. At the commencement of the yield a few red-hot pieces of coal are put at the base of the slit in order to bring about the flow of the oil. The balsam continues to flow for about 6 months; that obtained during the dry season is the best. Some trees yield annually, exceptionally, 200 liters and more of balsam; the average yield is 80 liters. The color of the balsam varies from bright-yellow to black-brown, according to the species of *Dipterocarpus* from which it is obtained; in transmitted light the balsam is clear and more or less red, in reflected light it is grey-greenish and non-transparent. The odor reminds of copaiba balsam, but is less strong; the taste is bitter, not acrid. The balsam (d. 0.982) consists of a resin and an essential oil of yellowish color and faint odor. From the resin, gurjunic acid, soluble in ether, carbon disulphide and alcohol, has been isolated. Gurjun balsam finds general application in Cochin-China as a varnish for coating boats, etc., as it increases the resistance of the wood. Satisfactory results have also been obtained in Europe in the preservation of wood by its application. The white balsam "shondrau" is the one most valued, and is exported in large quantities to China where it is used in the manufacture of lacquers.—Schimmel's Rep., April–May, 1905, 48.

Gurjun Balsam—Detection in Copaiba and in Balsam of Peru.—Beitter finds that when copaiba is shaken with 80 per cent. aqueous solution of hydrated chloral the volatile oil separates on the surface, and on removal may then be tested for gurjun oil, which gives with sulphuric and nitric acid the well-known blue color reaction. The method avoids the necessity of resorting to distillation in order to obtain the oil. If 1 drop of balsam of Peru is mixed with 2 Cc. of a mixture of 10 p. 80 per cent. hydrated

chloral solution and 1 p. of hydrochloric acid, sp. gr. 1.2, an olive-green color, changing to dark-green on heating, is produced if the sample contains gurjun balsam. Pure balsam of Peru produces a lighter green color in the cold, but on heating this changes to a leaf-brown color, and shows absolutely no green coloration whatever. Gurjun and copaiba have in this respect identical reactions, but are differentiated by shaking the balsam of Peru with petroleum ether, which extracts the gurjun balsam and yields it on evaporation. The test may then be applied to the extract.—Pharm. Ztg., *50*, No. 17 (March 1, 1905), 179; from Südd. Apoth. Ztg., 1905, No. 14.

Gurjun Oil—Poisonous Properties.—The "Revue de Chimie Industrielle," in view of the fact that "oil of wood," under which name gurjun oil passes current in France and Germany, is being more and more utilized in the manufacture of cosmetics, toilet soaps, etc., calls attention to the poisonous effects attributable to this oil. The exact character and properties of this oil are not well known, even among the best informed, and that which is known is not favorable—especially in regard to the lesions of the skin, ulcers, etc., the causation of which has been attributed to it. It is said to have been the cause of painful abscesses, the suppuration of which continued through months and even years. Diverse cases of intoxication have been reported among artisans working with the oil where, by accident or carelessness, it had been spilled upon the skin and caused grave troubles. An analogous case is presented by a lady who made use of a pomade for the lips that was based on oil of gurjun. The authorities should, indeed, interdict the employment of the oil in making perfumes, etc., simply on account of its siccative nature and the fact that it covers the epidermis with an impenetrable layer of varnish, which hardens until it becomes like horn. While the toxicity of the oils is a varying quantity, according to their source, degree of purity, etc., their employment in the manufacture of cosmetics should be absolutely proscribed.—Nat. Drugg., Jan., 1905, 6.

TEREBINTHACEÆ.

The Elemi Group of Resin Secretions—Resumé.—In concluding his researches on the different kinds of elemi found in commerce, which form a large and distinct group among the resin secretions derived from the family of the Burseraceæ, and are consequently closely related to the resin secretions known as olibanum, mastic, Mecca balsam, opoponax, bdellium and myrrh, derived from the same family, A. Tschirch briefly reviews the results obtained with Cremer, Reutter and Saal at different periods from 1902 to 1904 (see Proceedings 1903, 799–800). The elemis so far examined were:

1. *Soft Manila Elemi*, derived from Canarium commune.

2. *Hard Manila Elemi*, evidently from the same source, and resulting from loss of volatile oil while adhering to the tree.

3. *Yucatan Elemi*, derived from an *Amyris*, however, and therefore in distinction from the others from a Rutaceæ.

4. *African Elemi*, from the Camaroon, supposedly from a species of *Canarium*.

5. *Protium Elemi*, from Brazil, the product of *Almessega branca* (*Protium heptaphyllum*, March, var. *Venenosum*, Engl.).

6. *Caricari Elemi*, from Brazil, but unknown as to botanical source—probably a *Protium*.

7. *Carana Elemi*, from Northern Brazil, the product of *Protium carana* (Humb.), L. March.

8. *Colophonia Elemi*, from Mauritius, the product of *Colophonia mauritiana*.

9. *Tacamahaca Elemi*, from the Philippines, of undetermined botanical origin, but possibly from a species of *Canarium*, and rendered hard by the evaporation of the volatile oil, as in the case of *Hard Manila Elemi* (2), which it closely resembles.

These elemis all contain *amyrin* as a characteristic constituent; the amyrin having in all cases the same composition and properties, and being in its chemical relations regarded as a primary alcohol of the formula $C_{29}H_{47}CH_2OH$. Besides amyrin the elemis contain one or more of a series of *resin acids*, some of which are crystalline, others amorphous, together with considerable quantities of *resin* and *volatile oil*; while *bryonin* is a constituent of three of the elemis. The resin acids are differentiated according to their characters and composition. They form two types, designated as *elemic* and *eleminic acid* respectively, and these again are divisible into *α* and *β iso-elemic* and *iso-eleminic acids*, and are identified, as are the other constituents of the elemis, by the prefix of the first syllable of the specific name of the elemi—for example, "protelemic acid," the elemic acid in protium elemi, etc. A condensed review of the composition of the elemis is given in a series of tables, showing the percentage composition, the kind and characters of the resin acids, their composition, and the characters and composition of the resins; but these must be consulted in the original. As a practical outcome of these researches, it has been demonstrated that only those resin secretions that contain amyrin can be regarded as *true elemis*, and that the elemi group of resins, like the interesting group of coniferæ resins, is characterized by the occurrence of numerous isomeric resin acids.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 366–373.

Colophonia-Elemi—Characters and Composition.—A. Tschirch and O. Saal describe a sample of colophonia elemi, the product of *Colophonia mauritiana*, supplied by Mr. Holmes, curator of the museum of the British Pharm. Soc., and give the results of a chemical examination of the drug. It was yellowish-white, hard in consistence, and exhibited numerous larger or smaller portions of pure white substance throughout the mass, which

under the microscope were shown to consist of accumulations of crystalline needles. The odor, as in other sorts of elemi, reminded of fennel, dill and lemon oil. It was completely insoluble in water, entirely soluble in ether, warm alcohol, acetic ether, acetone, chloroform and toluol, partly soluble only in petroleum ether, carbon disulphide, methyl alcohol and tetrachloride of carbon. Its acid number, direct, was 35.0, indirect, 36.4; the saponification number, 61.6 cold, and 64.4 hot. 100 parts of the resin contained 2 per cent. colelemic acid; 10 per cent. *a*-iso-colelemic acid; 8 per cent. *β*-iso-colelemic acid; 25–30 per cent. colamyrin; 30–35 per cent. coleleresen; 3 per cent. light-yellow volatile oil, the greater part of which distilled at 170°–175° C, producing a colorless, pleasantly-odorous liquid; small quantities of bryoïdin and bitter principle, and 10 per cent. of vegetable fibre and impurities.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 348–351.

Tacamahaca-Elemi—Commercial Varieties and Composition.—Under the name of "tacamahaca" a large number of elemi resins are met with in commerce, as well as in pharmacognostic collections, which, although resembling each other in their external characters, give evidence of considerable variation in their chemical constituents. A. Tschirch and O. Saal describe a series of seventeen different sorts obtained from the pharmacognostic collections in the Institutes of Berne, Vienna and Strassburg, from which they derive two groups, the one containing crystalline components, the other only amorphous constituents. The

Crystalline Tacamahaca-Elemis are characterized by their dark, often black color, but contain light colored layers of crystalline nature throughout, and have a faint elemi odor. In nine out of fourteen samples, amyrin was found and isolated in its characteristic form, m. p. 170°–172° C. The plants from which some of them are derived are designated as being *Myrodendron amplexicaule*, Willd., in Guyana; *Bursera gummifera*, in Guadeloupe; *Calophyllum tacamahaca*, in Réunion, and *Elaphrium tomentosum*, in the West Indies and South America; while others, of unknown botanical origin, are produced in Central America, East Africa and the Philippines. The

Amorphous Tacamahaca-Elemis are of a lighter color than the crystalline sorts, some resembling olibanum, others myrrh, in appearance and consistency, and have a faint aromotic odor. Some of them were found to contain gum. Selecting as a typical and characteristic sample of these resins, a crystalline sort, designated

Philippine Tacamahaca-Elemi, the authors determined, by methods described in detail the following constituents: Tacamyrin, 30–35 per cent.; *a*-isotacelemic acid, 5 per cent.; tacelemic acid, 2 per cent.; *β*-isotacelemic acid, 3 per cent.; volatile oil, 2 per cent.; bitter principle, ½ per cent.; resin, 30–35 per cent.; impurities, 15 per cent. The latter con-

sisted of cortical matters, sand and earth. The volatile oil, obtained by distillation with steam, was of a light-yellow color, and had a peculiar aromatic odor, reminding of borneol, and quite distinct from that of the elemi itself, which, though only faint, reminds of dill, fennel and lemon oil. The elemi, with the exception of the impurities mentioned, was completely soluble in alcohol, ether, acetic ether, chloroform, bisulphide of carbon, benzene and toluene; partly soluble in petroleum ether, ligroïn, methyl alcohol and tetrachloride of carbon. Its consistence was hard, its color black-grey, and it was pervaded with the characteristic crystalline layers of a lighter color.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 352–365.

True Tacamahac Resin—Characters and Distinction from Tacamahac-Elemi.—A. Tschirch and O. Saal have also investigated and describe a resin product which is regarded by them as "true tacamahac resin" and appears to represent the amorphous type of tacamahac elemis at present found in commerce. Their investigation proves, however, that it cannot be considered as belonging to the elemi group of resin secretions, and they suggest that, provisionally, it may be placed in the Boswellia group of resen-resins. It occurs in clear, transparent pieces of a yellow to yellowish-brown color, about the size of a filbert, and softening when chewed. It yields to ether about 90 per cent. of a pure-yellow resin, melting at 85°–87° C., insoluble in water, but completely soluble in alcohol, ether, chloroform, benzene, toluene, petroleum-ether, methyl alcohol, acetone and carbon disulphide. It is devoid of crystalline constituents; its alcoholic solution has a faintly acid reaction. Subjected to the same analytical examination as the elemis, its components were determined to be the following: Gum, having the characters of gum arabic, 3 per cent.; tacamahinic acid—soluble in ammonium carbonate—½ per cent.; tacamaholic acid—insoluble in ammonium carbonate—½ per cent.; volatile oil, 3 per cent.; *a*-takoresen, 50 per cent.; *β*-takoresen, 30 per cent.; bitter principle, ½ per cent.; impurities, 10 per cent. Neither of the acids were obtainable in crystalline form by any of the methods tried. The volatile oil, obtained by steam distillation, only remotely reminded of the typical odor of the elemis, resembling more a combination of camphor and turpentine. The "true tacamahac resin" is, according to these results, characterized by a very high resen-content and the presence of gum, the total absence of amyrin, and very small quantities of resin acids, which, moreover, are uncrystallizable.—Ibid., 395–400.

West Indian Elemi—Two Sorts Commercially Known as "Gommier."—A resin, called "gommier," very similar in appearance to elemi and with a similar odor, but of a stiffer consistence, was exhibited at the Indian and Colonial Exhibition in London, in 1886, under the name of incense gum, said to be obtained from *Bursera gummifera*, and used for torches, etc. According to the Agric. News, *3*, 155, there is another variety, obtained from

Dacryodes Hexandra, also known as "gommier," which is opaque, white, and viscous. The former is a lowland tree and the latter found in the high woods. It is supposed that the latter is the kind referred to in the Bulletin of the Imperial Institute, March, 1904. Elemi is used for printing inks and spirit varnishes, and the price depends largely upon its freedom from impurities.—Pharm. Journ., July 9, 1904, 43.

Sumach Leaves—Percentage and Composition of Ash.—T. R. Trotman observes that sumach leaves should not contain more than 6.5 per cent. of ash, 0.75 per cent. of silica, and 0.15 per cent. of iron. Most commercial sumach contains more than this, but winnowing will readily reduce it to this standard. The presence of iron is exceedingly objectionable, causing stains in the goods treated.—Pharm. Journ., April 1, 1905, 484; from Journ. Soc. Chem. Ind., *23* (1904), 1137.

Pepper—Adulteration with Vetches.—The "Rep. de Pharm." (1904, No. 8) calls attention to adulteration of black pepper, whole and ground, with vetch seeds, known in French trade by the names of "erviop," "griffon" and "mito." The seeds are treated with a pungent aromatic substance, and then thoroughly dried so as to impart to them an appearance resembling pepper.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 772.

RHAMNACEÆ.

Buckthorn Bark—Colorimetric Valuation.—J. Warin finding the gravimetric determination of emodin in the bark of *Rhamnus frangula* to be unsatisfactory, the weight obtained being invariably too high, has devised the following simple colorimetric method, using a green solution of nickel as the color standard: The standard green nickel solution is prepared by dissolving 1 Gm. of metallic nickel in 5 Cc. of a mixture of nitric acid, 1 part, hydrochloric acid, 3 parts. The salt formed is dissolved in water with a little more of the acid mixture if required, made up to 100 Cc. and filtered. This green solution will neutralize the pink tint of a faintly alkaline solution of 1 Mgm. of emodin in 100 Cc. of water. It may be standardized against such a solution, since it is sometimes a shade weaker than this. Half a Gm. of the powdered bark is macerated, with occasional agitation, with 50 Cc. of 0.5 per cent. caustic soda solution for twenty-four hours; a portion of the liquid is then filtered off; 10 Cc. of the filtrate is diluted to 100 Cc. with distilled water. Two twin 50 Cc. tubes are then taken, one plain, the other graduated up to 40 Cc. in $\frac{1}{10}$ Cc. These are covered with black paper, in which two narrow slits 2 Mm. wide are cut on opposite sides of each tube, in such a manner that when the two tubes are placed in front of each other, with these slits coinciding, the light traversing them may be observed. The plain tube is then filled with the nickel solution, and 10 Cc. of the diluted buckthorn filtrate is placed in the graduated one. The tubes are then placed in front of one another on a white ground, with the slits coinciding. The color of the light trav-

ersing the liquid is then observed. It will generally be found to have a distinct rose tint. The pink liquid is therefore carefully diluted, and thoroughly mixed after each dilution, until the transmitted light is perfectly colorless. The volume of the fluid in the graduated tube is then read off. Each Cc. is equivalent to 0.1 per cent. of emodin in the bark. If at the first trial the green tint is found to predominate, indicating that the substance under examination contains less than 1 per cent. of emodin, a fresh alkaline maceration must be prepared, using more of the drug. The above process has been worked out with the colorimeter, using standard solutions of emodin, and has given concordant results.—Pharm. Journ., April 1, 1905, 483; from Jour. de Pharm. et Chim., *21* (1905), 253.

EUPHORBIACEÆ.

Caoutchouc—Varieties and their Connection with the Juice of Living Trees.—C. Harries has endeavored by his researches to ascertain the connection between commercial caoutchouc and the juice as freshly obtained from the living tree. The fresh juice rapidly coagulates, and Weber has shown that ether extracts an oil from the latex which, on addition of traces of formic acid, polymerises to caoutchouc. Hence he supposes that the latex contains not caoutchouc as such, but a very easily polymerisable hydrocarbon, possibly an aliphatic diterpene, $C_{20}H_{32}$. The author obtained 300 Cc. of the juice of *Ficus magnol. Borci*, and treated it with ether on the spot, thus dissolving most of the constituents; a residue remained which contained a reducing sugar. The ether extract could be separated by filtration from the insoluble residue, which perhaps consists of albuminous substances. By the evaporation of the ether a yellow syrup was obtained from the extract; this partially crystallized on standing. By precipitation with alcohol it was shown that the extract consists of two substances: (1) The substance which gives rise to caoutchouc, and (2) an oxygen compound, $C_{30}H_{48}O_3$. This latter crystallizes well, and the greater part of it could be separated from the first by repeated treatment of the extract with a little ether. As the oxygen compound was thus removed it appeared that the other substance was not an oil, but a tough white elastic mass showing great resemblance to caoutchouc. It is perfectly soluble in a sufficient quantity of ether, but it could be shown that its properties are not those of a diterpene. On distillation it behaves exactly like caoutchouc. It may be precipitated directly from the latex by means of alcohol and purified by taking up with ether and precipitating with alcohol. Analysis shows that it has the composition of para-caoutchouc. If to the ethereal extract of the latex a drop of formic acid is added, a white coagulated mass separates at once. This product is soluble in ether, but loses its solubility gradually on drying or on repetition of the treatment. This gradual change of solubility (after isolation) is perhaps due to an increase in the molecule. Thus caoutchouc occurs in the

latex of *Ficus magnol. Borci* (and also of *Ficus elastica*) in a form which differs in solubility from ordinary caoutchouc, but does not posses the properties of an aliphatic diterpene.—Chem. News, Dec. 16, 1904, 304; from Berichte, *37* (1904), No. 15.

Crude Caoutchouc—Solvents Suitable for its Examination.—In a previous paper Dr. G. Fendler has communicated a method for the examination of crude caoutchouc, which in its essentials depends upon the precipitation of a petroleum ether solution of the substance, filtered through glass wool, by the addition of alcohol. He had found, however, that some sorts of caoutchouc are only partly dissolved by petroleum ether and leave a residue of caoutchouc-like substance which simply swells in the solvent. Experiments have since been made, which show that this residue may frequently be dissolved by other solvents, such as benzene, chloroform, etc., and lead him to recommend the following procedure in such cases: If the caoutchouc (not taking into consideration heterogeneous impurities) is incompletely soluble in petroleum ether, the solubility of the swelled-up residue in benzene is to be determined, and also the external characters and oxygen content of the fractions of caoutchouc substance obtained. The nitrosite-method of examination (see below) is unnecessary and, moreover, uncertain; being in the author's opinion useful only in the analyses of vulcanized rubbers, in which the object is confined to the determination of quantity and not quality of caoutchouc substance. But even here the results must be accepted with caution.—Pharm. Ztg., *49*, No. 78 (Sept. 28, 1904), 825.

Caoutchouc—Valuation by the Nitrosite Method.—Karl Dieterich discusses the importance of determining the value of commercial sorts of caoutchouc, which becomes necessary because of the modern supply of East African, Asiatic, Australian and other inferior rubbers as substitutes for, and adulterants of, Para rubber. He recommends for this purpose the nitrosite method of Harris, applied as follows: About 1 Gm. of the sample is dissolved in 100 Cc. of benzene, and gaseous nitrous acid, generated from 1 p. starch, 2 p. arsenous acid, and 2 p. nitric acid, sp. gr. 1.35, is passed into the clear benzene solution until the sticky nitrosite formed assumes a firm consistency. The precipitate is then washed on a tared filter, first with benzene, then with ether, dried to constant weight and weighed. For the purpose of control, the precipitate may be dissolved in acetone, and any undissolved residue is dried at 100° C., weighed, and deducted from the sum previously obtained. In case of inferior and impure sorts, a good average sample is dissolved in the benzene as far as possible, and the turbid solution treated with N_2O_3 as when clear solutions are used. The nitrosite so formed after washing as before is then dissolved in acetone, and this on evaporation yields the pure nitrosite in a weighable form. Classification of the solution of caoutchouc by filtration is practically impossible, hence the second indirect method of estimation is ad-

vantageous in the valuation of impure sorts. Regarding the method of Fendler (see above), the author observes that its relative value or possible superiority over the nitrosite method can only be established by future experiments and experience. Moreover, Fendler's method does not determine the total pure caoutchouc substance, but only the caoutchouc hydrocarbon.—Pharm. Ztg., *49*, No. 79 (Oct. 1, 1904), 842–843.

British Guiana Rubber—Source, Method of Collection, etc.—E. M. Holmes calls attention to the rubber collected on the Nicharé river in British Guiana. The trees yielding the rubber, judging from the flowers and leaves submitted to Dr. J. K. Small, of Columbia University, appears to be a species of *Micrandra*, a genus nearly allied to *Hevea*, and nearest to the

Micrandra siphonoides of Brazil, but differing somewhat from it, and probably an undescribed species. Mr. E. Andre, in "A Naturalist in the Guianas" (London, 1904) gives a description of the method of collecting the rubber by the natives, which is produced in Mr. Holmes' paper, and will be read with interest. although the method in general does not differ from that described as being practiced in other South American regions. Mr. Andre believes that when the Nicharé and other unexplored tracts in the basin of the Caura come under settled government, the rubber industry will form an important source of revenue, but under the present conditions expeditions are too costly to give profitable results.—Pharm. Journ., Feb. 4, 1905, 142.

Gutta Percha—Cultivation in German East Africa.—According to "Rev. des Cult. Colon." (*14*, 337–338), of the known species yielding good rubber, the following have been selected for cultivation in Usambara, viz.: *Palaquium oblongifolium*, *P. gutta*, and *P. borneense*. Although *P. treubii* and *Payena leerii* grow rapidly, and are easily cultivated, the gutta is of less value. The species appear to be differently affected by the light heat. *P. oblongifolium* grows best, especially when young, if shaded by *Albizzia moluccana*, and is apparently detrimentally affected by sun and wind. *P. gutta* and *P. borneense*, on the other hand, are but little affected by solar heat and light.—Pharm. Journ., Nov. 12, 1904, 706.

New Guinea Gutta Percha—Constituents.—A. Tschirch and O. Müller have made a comprehensive investigation of gutta percha derived from *Palaquium supfianum* in German New Guinea, in the course of which they found it necessary to adopt a new terminology for the substances isolated by them. The older terms, crystalalban, sphaeribalban, isosphaeribalban, etc., having been adopted by Prof. Tschirch only provisionally are now abandoned; the authors, however, retain the terms "gutta," "alban," "fluavil" and "albanan," but use them in a generic sense, and in order to designate their source use a prefix; for example, the alban from New Guinea gutta percha is mentioned as "guin-alban," from Sumatra gutta

percha as "sum-alban" (or sumalban), etc., and these may again be designated as α-guinalban, β-guinalban, γ-guinalban, etc. The albans are soluble in boiling alcohol, the fluaviles in cold alcohol, and the albanans neither in cold or hot alcohol. In these investigations the microscopic examination of the different constituents proved most serviceable, their analyses being attempted only after obtaining a uniformly constant microscopic field.

New-Guinea gutta percha is almost entirely soluble in cold benzene, chloroform, carbon disulphide, and toluene, as well as in boiling ether and petroleum spirit. Repeated boiling with alcohol yielded 28 per cent. of albans and 8 per cent. of fluavils. The residue insoluble in alcohol was dissolved in chloroform, filtered, and poured into alcohol, by which means the gutta separated at once as a spongy mass; the mother liquor slowly deposited the albanans as a crystalline mass on standing; these were purified by repeating the process. The gutta itself was purified by repeatedly dissolving in chloroform and precipitating with alcohol. The *fluavils* were separated by treatment with 80 per cent. alcohol into α-guinfluavil and β-guinfluavil, both yellow amorphous substances. Alcoholic potash hydrolyzed each into cinnamic acid and a distinct crystalline resinol. The *albans* were separated by treatment with warm 96 per cent. alcohol into three distinct crystalline substances—viz., α, β, and γ-guinalban. The two latter were hydrolyzed by alcoholic potash, yielding in each case cinnamic acid and a distinct crystalline resinol. Of the *albanan* (guinalbanan) only 0.7 per cent. was obtained, but again in crystalline form, and with constant melting-point. Exposure to light, however, resulted in a lowering of the melting-point, with simultaneous increase in the solubility in water. The *gutta*, which forms the bulk of the drug, was obtained by deposition from its hot ethereal solution as minute curved crystalline needles, which, however, gradually agglomerated into a solid mass. When pure it is quite white, and remains so when kept under ether or alcohol, but when dried and exposed to the air it assumes a reddish color. It is not attacked by alcoholic potash.—Arch. d. Pharm., *243*, No. 2 (April 13, 1905), 114–132.

Sumatra Gutta Percha—Characters of Albans and Fluavil.—Following the preceding paper on New Guinea gutta percha, the same authors give the details of experiments to determine the nature of the albans and of the fluavil in Sumatra gutta percha. The author finds that the albans from the latter are also crystalline. These are designated respectively α, β and γ sumalban, and like the albans of New Guinea gutta percha, they yield on hydrolysis with alcoholic potash, cinnamic acid and characteristic resinols, which are designated respectively α, β and γ, sumalbaresinol. One of the fluavils also yielded cinnamic acid and a characteristic resinol.—Ibid., 133–140.

Mikindani Caoutchouc—Constituents.—A third paper by Tschirch and Mueller gives the following results of an inquiry into the resinous bodies in

caoutchouc resembling the albans. They have examined those from an East African variety, Mikindani caoutchouc, and retaining for them the same terminology as adopted for the constituents of gutta percha, describe two albans, as α- and β-danialbans respectively. These differ, however, from the albans described in the preceding paper by not yielding cinnamic acid on hydrolysis with alcoholic potash.—Ibid., 141–146.

Euphorbium—Constituents.—A. Tschirch and Paul, as the result of comprehensive research work on euphorbium, find this secretion to have the following quantitative composition:

1. Free resin acids:
   Euphorbic acid, $C_{24}H_{30}O_6$, amorphous, soluble in ammonium carbonate ..... 0.7 per cent.
2. Aldehyde: Insignificant quantity, not further examined.
3. Resens:
   a. Euphorbin, $C_{30}H_{48}O$, crystalline, soluble in solution of potassium hydroxide, about ..... 40.0 per cent.
   b. Amorphous resens, insoluble in solution of potassium hydroxide, about ..... 21.0 per cent.
4. Water soluble portion:
   a. Malic acid, calculated from the ash content of the euphorbium, about ..... 25.0 per cent.
   b. Carbohydrate ..... 2.0 per cent.
5. Bitter principle, acrid principle, impurities and loss, about .... 11.3 per cent.

Euphorbium contains neither gum nor soluble oil.—Arch. d. Pharm., *243*, No. 4 (June 5, 1905), 249–291.

Shellac—Determination of Rosin Present as Adulterant.—The scarcity of shellac has led to much adulteration with rosin, for the determination of which the following method is suggested by A. C. Langmuir: 0.2 Gm. of ground shellac is introduced into a 250 Cc. bottle with ground stopper; 20 Cc. of glacial acetic acid is added, and the mixture warmed gently until solution is complete (except for the wax). A pure shellac is rather difficultly soluble. Solution is quicker according to the proportion of rosin present; 10 Cc. of chloroform is added, and the solution is cooled to 21° C. to 24° C. The temperature should be held between these limits during the test. The color at this stage is a light-yellow. Little difference is noticeable between shellacs, the lac dye having little effect; 20 Cc. of Wijs' solution is added from a pipette, the end of which has been heated to somewhat diminish the size of the orifice. The bottle is closed and the time noted. The solution is stood in a dark place. Pure shellac will scarcely alter the color of the Wijs' solution. If in small amount, rosin will produce a slowly appearing red-brown color. In large amount rosin causes an immediate coloration, increasing in intensity as time passes. After one hour, 10 Cc. of 10 per cent. potassium iodide solution is added. The solution is immediately titrated with $\frac{N}{10}$ thiosulphate solution; 25 Cc., or 30 Cc. may be run in immediately, unless the shellac is very impure,

and the remainder gradually, with vigorous shaking. Just before the end, a little starch solution is added. The end point is sharp, as the reaction products of shellac remain dissolved in the chloroform. Any color remaining after a half minute or so is disregarded.

Standard samples of shellac obtained from a well-known firm gave iodine absorption values of 16.0, 15.4, 16.0, 13.5, 15.1, 19.7, 21.5, 14.8, 17.2, 18.5, 16.0, 31.4, 15.4, 15.4, and 26.5. Many other analyses of shellacs, which have bleached well and gave no evidence of rosin in any way, gave iodine values of 18 or less. After a consideration of the iodine values of the better grades of standards and the others given, it must be admitted that it is perfectly fair to take as the iodine number of a shellac free from rosin the number 18. If anything, this value favors the dealer, for an absolutely rosin-free shellac undoubtedly has a value below this. Roughly speaking, it could be said that a shellac with a value 18 or less would be a good shellac. Such a shellac will give good results when used; 18 to 23 would be a fair shellac. At 23, various quantitative tests for rosin begin to reveal its presence; 23 to 28 would indicate a poor shellac; 28 to 33 bad. A shellac above 33 is grossly adulterated. For manipulative details and descriptions of other tests the original paper must be consulted.—Pharm. Journ., Jan. 28, 1905, 113; from Journ. Soc. Chem. Ind., *24* (1905), 13.

Cascarilla—Substitutes.—Some time ago C. Hartwich called attention to the increasing scarcity of cascarilla bark in commerce, and described a spurious bark which had been evidently derived from a species of *Crotonis*, but not that yielding the official bark. The author now, in conjunction with A. Hellström, describes three other substitutes, all of which are derived from species of *Crotonis*, and gives the characters of distinction of these from true cascarilla bark. The first of these is a young bark, resembling cascarilla very closely, which, however, is devoid of lignified cells. A second spurious bark comes from Nicaragua. The cork of this is characterized by longitudinal and transverse fissures, the primary bark by abundant stone-cells in connected layers, while the secondary bast fibres form large groups. The taste of this bark resembles anise. The third bark is obtained from Honduras, and has been previously (1901) described. Its taste is camphoraceous.—Apoth. Ztg., *20*, No. 36 (May 6, 1905), 353.

URTICACEÆ.

Cannabis Indica—Relative Value of Different Sorts.—E. M. Holmes calls attention to specimens of *Cannabis indica* recently presented to the Museum of the Br. Phar. Society, possessing a fine green color, from two widely different localities—the one having been grown in Uganda and the other in the north of France. These had a much brighter and cleaner appearance than the Indian drug as usually imported, and there being no

export duty to be paid on them, were naturally offered at a cheaper rate. As both of these are likely to be offered in the drug market, preparations made from these two varieties and from the genuine Indian drug by Mr. J. C. Umney, were subjected to physiological study and experiment by Dr. W. E. Dixon, who reports the Indian drug to be the most active, while the other two, though also active, were not nearly so effective as the Indian sample. The African is a little more active than the French, but the difference is not very great. The percentage of extract afforded by these varieties treated with 90 per cent. alcohol has been determined by Mr. C. T. Bennett to be as follows: French, 8.3; African, 11.0; Indian, 9.7 to 11.9 per cent. The tinctures (90 per cent. alcohol) of the French and African are of a much brighter green color than the Indian, and the tincture of the last-named when poured into water gives a more turbid solution, indicating a greater proportion of resin to the other extractive matter. The deficiency in odor, the absence of resin sticking the flowers and fruits together, and the unusually bright color, will be sufficient to permit of the recognition of these less active forms of the drug.—Pharm. Journ., April 15, 1905, 550.

Majum—An East Indian Confection Containing Indian Hemp.—David Hooper observes that, although "majum" is mentioned among some obsolete terms in the new part of the Oxford Dictionary, this ancient Arabic confection is far from obsolete, the "majoon" or "majum" is known at the present time from one end of British India to the other. *Majum* is a Sanskrit and Tamil name used for a confection in which a preparation of Indian hemp (*Cannabis sativa*) forms an ingredient. The names of other similar preparations are *yakuti* (in general use from the Deccan northwards), *purnathi* (Madras), *gulkhand* (Bombay), and *legium*. These are all sweetmeats prepared in much the same way with ganja, bhang, or sometimes charas, their various names and properties depending on the proportion of hemp drugs and other ingredients they contain. Their basis is sugar, ghee or melted butter, and milk, and the essence of the hemp is extracted by the aid of heat and compounded with other drugs, spices, and perfumes. Some recipes for *legium* shown to the author in South India contained, besides ganja, about a dozen other ingredients, including cloves, nutmeg, cardamoms, aniseed, pepper, ginger, liquorice, almonds, dates, salep, honey, and sugar. In some of these electuaries opium, dhatura, and nux vomica, are combined to render them more intoxicating, but as a general rule majum consists principally of sugar, as the more active portions are strained out of the mixture before it is evaporated to dryness and made into cakes. The author describes and gives the composition as far as ascertained by him of a large number of varieties of "majum," designated by a Commission on Hemp Drugs held in India in 1893–94, as Allahabad-, Benares-, Bombay-, Amballa-, Hyderabad-, Coimbatore-, Octacamunt-, and Tanjore-majums, which bear testimony to the

wide-spread use of this confection, and states, furthermore, that notwithstanding the evidence that "majum" was more of a harmless confection than a medicinal substance, the Commission decided to consider it a drug. —Chem. and Drugg., Mar. 25, 1905, 492.

Cecropia obtusa, Trécul—*A Possible Digitalis Substitute.*—Experiments carried out by Gilberts and Cornote lead to the belief that the leaves of *Cecropia obtusa*, Trécul, may prove valuable as a substitute for digitalis. They are a powerful cardiac stimulant, without material effect upon arterial pressure, and exert profuse diuretic action, independent up to a certain point, however, of the action of the heart.—Pharm. Ztg., *50* No. 47 (June 14, 1905), 498; from Bull. des Sc. Pharm., 1905, 200.

Powdered Elm Bark—Unsatisfactory Commercial Condition.—The powdered elm bark of the market is shown by the examination of thirty-eight samples collected by the adulteration committee of the Michigan Pharmaceutical Association to be anything but satisfactory. Oft-repeated reports have shown that slippery elm is adulterated with starch, mainly wheat, but in many cases the wheat has been found in such small quantities that accidental contamination and not intentional adulteration might better have been reported. The value of elm bark lies in its contained mucilage, yet little attention seems to have been directed to its quality in this particular. The report that slippery-elm bark is exhausted of its mucilage, which is employed for special purposes, and the dried powder disposed of to eastern jobbers is quoted along with the observation that elm bark with enough mucilage to make an adhesion poultice is at times hard to obtain. At the same time a low mucilage content may sometimes be due to a poor quality of bark—one collected at an improper season of the year. A first-class powdered elm bark will make a thick mucilage that can scarcely be poured out of its container when 10 grains are digested in the cold with one fluidounce of water. In such samples which contain little or no mucilage the fibres settle more or less to the bottom, leaving a supernatant liquid. Of the samples examined a majority were found by the committee to contain no added starch. Only about half of the samples produced a fairly thick mucilage.—Pharm. Era, Dec. *22*, 1904, 632; from Proc. Mich. Pharm. Assoc., 1904.

CUPULIFERÆ.

Cork Forests—Destruction in Italy.—The "Scientific American" says that the cork industry will receive a fresh impetus, a new process having been discovered by which large pieces can be made out of small ones, so that cork waste can be utilized in large quantities. This is all the more important as the price of cork increases steadily, both on account of the growing demand and the lessened supply of the raw material. Formerly, Italy was a large producer of cork, but a great part of her splendid cork-oak forests has always been destroyed. In some provinces—as, for in-

stance, in Calabria—the trees have been felled and used for charcoal making; in other provinces they have been cut down on account of their high potash contents. Only Sicily and Sardinia are still producing cork to any considerable extent in Italy, while the former great oak forests of Calabria are almost totally destroyed. It seems incomprehensible that this destruction has been permitted. The trees easily reach an age of 200 years. They yield cork in their thirtieth year and continue to do so every seven years. Seventy-five years ago the English demand for cork was supplied exclusively from Italy. The destruction of the remaining forests goes on uninterruptedly, and nobody seems to try to prevent it or to plant new forests in spite of the fact that Italy possesses the most favorable climate and soil for the cork oak, the most favorable conditions for its growth being found in the volcanic soil of the peninsula.

Larger forests of cork-oak trees are still existing in Spain, Portugal, France, Algeria and Tunis. None are found in Asia Minor and only rarely in Greece and European Turkey, although the climates seem to be favorable for their growth. The area covered by these forests is estimated at 300,000 hectares (741,300 acres) in Portugal, 250,000 hectares (617,750 acres) in Spain, 280,000 hectares (691,880 acres) in Algeria, and only 80,000 hectares (197,750 acres) remain in Italy.—Midland Drugg., October, 1904, 134.

CONIFERÆ.

Abies Amabilis—Characters of the Oleo Resin.—Frank Rabak, in continuation of his efforts to raise the mystery that has heretofore surrounded the source and production of Oregon balsam (which see), has subjected a sample of oleoresin from *Abies amabilis*, supplied with specimens of twigs and bark of the tree yielding it by Mrs. S. Langille, of Hood Rise, to physical and chemical examination. The oleoresin was decidedly liquid, pale yellow in color, and had a decidedly limonene-like odor, slightly turbid, sp. gr. at 22°, 0.852; optically inactive; acid number, 44. The colorless volatile oil (40.3 per cent.) had the limonene odor of the oleoresin; sp. gr. 0.852 at 22°; $a_D = -14° 24'$. The chemical investigation makes it probable that this oil consists largely of pinene, with some limonene. The resin is optically inactive; its acid number is 70. Tables showing the constants of this oleoresin, of the oleoresin of *Abies balsamea*, and of Oregon balsam are given.—Pharm. Rev., Febr., 1905, 46–49.

Cypress Pines—Species Occurring in New South Wales.—J. H. Maiden describes and figures eight species of cypress pines occurring in the forests of New South Wales. They are *Callitris columellaris*, *C. macleayana*, *C. verrucosa*, *C. robusta*, *C. muelleri*, *C. propinqua*, *C. calcarata*, and *C. cupressiformis*. Some of these yield sandarac resembling the Algerian product, but it is not at present collected to any extent. Maiden speaks, however, highly of the fragrance of the wood when used as fuel. There is

nothing, he says, more delightful than the approach on a winter evening to a township where Cypress pine is used as fuel. "Its delicious perfume is borne on the air for miles." With the usual perversity of popular names these trees are not cypresses, and are still more widely separated from the pines. Some botanists refer the Algerian tree not to *Callitris*, but to *Tetraclinis*.—Pharm. Journ., Febr. 4, 1905, 149; from "Forest Flora of New South Wales," through Gardn. Chronicle, *37*, 41.

Red Cedar—Identity of the Jamaica and Florida Plants.—The opinion expressed several years ago that the red cedar of Jamaica is quite distinct from that of Bermuda and identical with that of Florida, is now confirmed by the researches of Prof. Sargent (Bull. Dep. Agric., *2*, 83) who separates *Juniperus virginiana* into three species: (1) The northern plant, which retains the name *J. virginiana*, and is distinguished by erect branches, which usually make a narrow compact pyramidal head with comparatively stout branchlets and fruit which ripens at the end of the first season; (2) *Juniperus barbadensis*, which has long, often pendulous, branches and more slender pendulous branchlets, with smaller fruit, ripening at the end of the first season; (3) the red cedar of Western America, with rather stouter branchlets, fruit which does not ripen until the end of the second season, and brighter colored, usually reddish-brown wood. The wood of the *J. barbadensis* is more easily worked than the northern cedar, and for many years, until the supply began to be exhausted, was exclusively used by the German manufacturers of pencils, who established large factories for cutting wood on the coast of Florida.—Pharm. Journ., July 9, 1904, 43.

Larix Europoea—Characters of Oleoresin.—Frank Rabak, having obtained a quantity of oleoresin from borings made approximately to the center of the trunk of a specimen of *Larix europoea*, grown on American soil (Wisconsin? Rep.), he subjected it to examination for the purpose of comparison with the oleoresin obtained from the same species grown in Europe. The American oleoresin was light yellow in color, rather thick and possessed an agreeable terebinthinate odor. Sp. gr., 1.0004 at 22°, angle of rotation of a 5 per cent. alcoholic solution + 2° 20′ in a 100 Mm. tube, hence $a_D = +46° 29'$; acid number, 60. The volatile oil had a pleasant terebinthinate odor; sp. gr. 0.867 at 22°; $a_D = +2° 36'$. The optical rotation of the resin was found to be + 2° 5′. The oleoresin derived from the same species grown in Europe is described in "The Volatile Oils" of G. H. K., as having a rotation, $a_D = +9.5°$; the oil, a sp. gr. 0.878 and optical rotation $a_D = +11°$; and the resin, an optical rotation $a_D = +12° 36'$.—Pharm. Rev., Febr., 1905, 44–46.

Oregon Balsam—Source and Characters.—With the object of correcting the impression conveyed in a recent article by E. Dowzard that the so-called Oregon balsam is an artificial product obtained "by dissolving colophony in oil of turpentine" (see Proceedings, 1904, 742), Frank

Rabak has undertaken to determine the actual source of this oleoresin, which he had reason to regard a natural product. His inquiries evidently leave no doubt that this "balsam" is collected from a species of fir, or possibly several species. Samples of twigs and cones of a tree that undoubtedly yields this product have been received from Dr. J. A. Lamberson, of Lebanon, Oregon, and these were identified by R. H. Denniston to belong to

Pseudotsuga mucronata, Sudworth, a plant which enjoys a long list of synonyms (not necessarily reproduced here), and under the synonym *Pseudotsuga Douglasii*, Carriere, with the common names, Douglas spruce, Douglas's spruce fir, red fir, is described in Coulter's Rocky Mountain Botany (1885), and stated to be found throughout the Rocky Mountains and the mountains of California, reaching greatest proportions in Oregon. Examinations of Oregon balsam made during the past academic year by the class in phytochemistry (in the University of Wisconsin), have determined an average content of 25 p. c. of oil. In three samples of oleo resin, obtained respectively in 1902, 1903 and 1904, the following constants were observed in the order named: Sp. g., 0.994, 1.01, 0.985; a_D, —1° 16′, +4° 13′, +2° 30′; acid number, 102, 103, 116. The oil obtained by steam distillation had the agreeable terebinthinate odor common to coniferous oils when freshly distilled from oleoresins. The density and angles of rotation, given in the same order as those of the oleoresin, were as follows: Sp. gr., 0.873, 0.857, 0.822; a_D, —39° 55′, —37° 46′, —34° 37′. For further details, concerning the fractionation of the oil and the examination of the resin, the author's original paper must be consulted in Pharm. Rev., Aug., 1904, 293–299.

Savin—Small Yield of Volatile Oil from the Dry Leaves.—See *Oil of Savin*, under "Organic Chemistry."

African Copal—Description of Different Sorts.—C. Coffignier describes several sorts of African copal as follows:

Kissel Copal, owing to its appearance known as flint gum, occurs in irregular rounded very brittle pieces varying in color from white to reddish yellow. The fracture is vitreous aud very bright. It softens at about 65° C., and melts at 110° C. It is odorless, and contains but little impurity. It leaves 57.4 per cent. of insoluble matter when boiled with ethylic alcohol, 8.5 per cent. with amyl alcohol, 5.7 per cent. with aniline, 10 per cent. with amyl acetate, 11.6 per cent. with benzaldehyde, and from about 30 to 70 per cent. with other organic solvents.

Cameroon Copal occurs in irregular lumps or pieces of pale yellow or reddish tint. The pieces are very hard and break with difficulty, showing a bright vitreous fracture. It has a slight piperaceous odor. It softens at about 100° C., and melts at 150° C. With ethylic alcohol it leaves 66.7 per cent. of insoluble residue, 19.2 per cent. with amyl alcohol, 8.4 per

cent. with aniline, 12 per cent. with amyl acetate, 22.8 per cent. with benzaldehyde, and from 55 to 78 per cent. with other solvents.

Accra Copal forms long whitish or yellowish irregular pieces with a bright, vitreous or opaque fracture. The pieces are easily broken, and have a strong pepper-like odor. It softens at about 75° C., melts at 120° C. In behaviour towards solvents it resembles Kissel copal, but is distinctly more soluble, only 4.1 per cent. being insoluble in amyl alcohol, 2.5 per cent. in aniline, and 7.4 per cent. in amyl acetate. In actual practice in varnish making, Cameroon copal is found to give the best results. It is not the most soluble copal which produces the best varnish. —Pharm. Journ., Mar. 25, 1905, 441 ; from Bull. Soc. Chim., *33*, (1905), 174.

CYCADEACEÆ.

Cycas Circinalis—Toxic Constituent of the Fruit.—Van Dongen has isolated a toxic glucoside, "pakoin," from the fruit and fruit juice of *Cycas circinalis*, indigenous to the Dutch Indies, where it is known as "Bidji Pakoe Hadji."

Pakoin is an amorphous light yellow powder, soluble in dilute alcohol, but insoluble in most organic solvents. It contains no nitrogen. The fruits contained no alkaloid, but crystals of phytosterin were isolated from them.—Pharm. Journ., Nov. 26, 1904, 773 ; from Pharm. Weekbl. 1904.

B. Annimal Drugs.

Trombidium Grandissimum—An East Indian Medicinal Mite.—David Hooper says that among the few specimens of animal material medica used in India is a small acarid resembling a spider, the oil of which is expressed and applied in various disorders. It is known as "Bhir-buti," "Birbhoti," or "Bir bahoti" in Northern India, and occurs more frequently in the Punjab, United Provinces, and Behar. It appears on the ground in the rainy season, and is on this account called the "rain's insect." Another characteristic of the mite is its bright scarlet color and the resemblance of the individuals to pieces of scarlet velvet.—On the authority of R. J. Pocock this mite is designated as *Trombidium grandissimum*. It is about half an inch long and from a quarter to three-eighths of an inch in its widest part. It is covered with a scarlet velvety down, and appears on the ground at the beginning of the rainy season in July. It is only to be found for a few weeks in the year, when it is collected and kept for sale at the bazaars. The mite and the expressed oil have a great reputation among the Mahomedans as an aphrodisiac. The oil is also used as an external application for various complaints. In Bengal it is considered to act as a nervine tonic. A chemical examination of this interesting oil has recently been made by Professor E. G. Hill, of Allahabad. The specific

gravity of the red oil at 15° C. was 0.907, which ultimately set into a semi-solid mass, melting at 18°–19°. It had a peculiar odor. With strong sulphuric acid it gave a vivid blue color, gradually turning green. With nitric acid the red color was destroyed. With nitrous acid it gave a buttery elaidin in a few hours. The following constants were determined :— Acid value, 62.3 ; saponification value, 194.7 ; ester value, 132.4 ; unsaponifiable, 3.7 ; Reichert-Meissl, 0.55 ; Hehner value, 94 ; iodine value, 65. The constants of the free fatty acids, consisting chiefly of the myristic and oleic acid, were found to be :—Saponification value, 199 ; iodine value, 66.6 ; melting-point, 31°–32° C. The principal constituents were myristo-diolcin, with small quantities of stearin, cholesterol, coloring matter, and butyric acid. From these results the author concluded that the oil did not possess the properties of a counter-irritant which had been ascribed to it by older writers, and that its efficacy as a medicine is purely imaginary, and due to its color.—Pharm. Journ., May 6, 1905, 650.

Beeswax — Detection of Foreign Coloring Matter. — According to P. Lemaire, if a little wax is dissolved in chloroform and two or three drops of hydrochloric acid are added to the solution, a rose-red color is produced in the presence of foreign coloring matter. Or, a small quantity of the wax is boiled with 5 to 6 Cc. of water and 0.5 Cc. of soda solution, and hydrochloric acid is added in slight excess. If the liquid assumes a pale-green color on addition of ammonia, the addition of foreign coloring matter may be assumed. Finally a little of the wax may be carefully boiled and heated in a porcelain dish with some solution of boric acid until the water is completely evaporated. If the residue assumes a reddish coloration the wax has probably been colored artificially.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 758 ; from Rép. de Pharm., 1904, No. 8.

Beeswax—Adulteration.—H. A. B. Dunning observes that while beeswax is a very complex substance in composition, it is not yet quite definite in its nature. Pure wax has a uniform specific gravity of 965–975, and melting-point from 63°–65° C. It is acted upon by solvents in a characteristic manner, being completely soluble in warm ether, chloroform, fixed and volatile oils ; partially soluble in benzene ; sparingly soluble in cold alcohol, but almost complete soluble in hot alcohol. The free acids and compound ether of beeswax exist in definite proportion—the free acids in the proportion 19 to 21, the ether 73 to 76, making the entire saponification number from 92 to 95, and consequently a ratio of 3.7 ether to 1 of acid. Wax is no longer adulterated with heavy mineral substances, the most common adulterants being ceresin or paraffin. These, however, are non-saponifiable, hence their addition may be readily recognized by the lowering of the saponification number, unless the adulteration is done in a scientific manner. And this is unfortunately often the case in the addition of fatty acids, Japan wax, stearin, resin, etc., which have high saponification numbers, being made in order to overcome the depression of that number

by the paraffin. The author, however, points out some special tests for paraffin, which enable its detection, or that of ceresin, even in adulterated beeswax, in which the saponification number, has been made to appear normal by the addition of some of the substances mentioned. In the present paper, which will be consulted with advantage, the results of the examination of three samples of wax are given, one of the samples being pure beeswax, the other two adulterated, the one with paraffin, the other with both paraffin and resin.—Proc. Md. Pharm. Assoc., 1904, 75–78.

Wax—Determination of the Saponification Number.—Buchner recommends the following manipulation, based on the method recently described by Grünhut and Woy, for determining the saponification number of wax: —After having ascertained the acid number of the wax, 35Cc. of ½N-alcoholic potassium hydrate solution and 3.6 Gm. of the wax are placed into an Erlenmeyer flask; this is surmounted with a Soxhlet extraction apparatus and ball-condenser, and the contents of the flask are kept boiling for one hour on an asbestos-wire net, an operation which requires no attention during that time. The greater part of the alcohol may then be recovered by reversing the condenser, and the product of the reaction titrated in the usual manner. The results are admirable, and concordant even when the wax contains ceresin.—Pharm. Ztg., *50*, No. 9 (Febr. 1, 1905), 91: from Chem. Ztg., 1905, No. 3.

Portuguese Beeswax—Examination of Numerous Samples.—H. Mastbaum gives the following figures as the mean results of the examination of twenty-one samples of Portuguese beeswax:—Sp. g. at 100°C., 0.8152; m. p., 64.5 C.; solidifying point, 62.8; acid value, 18.35C.; saponification value, 91.2; ester value, 72.8; iodine value, 10.1; Buchner index, 2.05.—Pharm. Jour., Dec. 3, 1904, 814; from Monit. Scientif. (4), *18*, (1904), 703.

East-Indian Beeswax—Sources, Trade and Composition.—D. Hooper has written a very complete and interesting paper on the sources, trade and composition of the beeswax of British India. The wax is derived from three species of bees, *Apis dorsata*, *A. indica*, and *A. florea*, but chiefly from *A. dorsata*. The wax separated from the combs of the three species is practically identical in composition and is rarely adulterated. Indian beeswax differs in analytical figures from European chiefly in its lower acid value. It is procurable in large quantities, and should prove a valuable commercial source of the article. The wax derived from *Apis florea* had the average m. p. 64.2° C., the highest figure being 68°, the lowest 63° C. The mean acid value was 7.5; highest 8.9, lowest 6.1; mean ester value 95.61; highest 123.8, lowest 80.8; mean iodine value 8.0, highest 11.4, lowest 6.0. *Apis dorsata* wax had the average m. p. 63.1° C.; highest 67° C., lowest 60°; mean acid value 7.0; highest 10.2, lowest 4.4; mean ester value 89.4; highest 97.8, lowest 69.5; mean iodine number 6.7; highest 9.9, lowest 4.4. *Apis indica* wax melted at the

average at 63.25° C.; highest 64°, lowest 62°; mean acid number 6.8; highest 8.8, lowest 5.0; mean ester value 89.6; highest 95.9, lowest 84.0; mean iodine number 7.4; highest 9.2, lowest 5.3. In addition to the wax furnished by the genus *Apis*, some is also collected from the allied Dammar or Kota bees, *Melipona* (*Trigona*) sp. These are minute stingless bees, about ⅛ in. long, which make a sticky, dark-colored wax. This has the average m. p. 70.5° C.; acid number 20.8, ester number 89.6, and iodine number 42.2. It is quite distinct in physical and chemical characters from true wax, more nearly resembling the propolis of honey bees. The honey of the Trigonæ has a peculiar flavor, and is valued by some native tribes for its medicinal properties.—Pharm. Journ., Oct. 8, 1904, 505; from Agric. Ledger, 1904 [7], 73.

Japan Wax—Increase in Iodine Absorption of Recent Samples.—Some years ago Ernest J. Parry examined a number of samples of Japan wax and found that no pure specimen gave iodine, absorption value above 6 to 7 per cent., usually not higher than 4 per cent.—these results being in accordance with those published by Hübl. and others. Quite recently, however, Bernheimer and Schiff have published figures from 10.6 to 11.3, and Ahrens and Hett give from 13.1 to 15.1 per cent. Such a rise in this very constant figure would at once suggest a change in the composition of the commercial article. The author has now examined Japan wax manufactured by the leading firm in Japan dealing in this article, with the following results:

	1	2	3	4	5
Melting-point.....	50°–51°	50°–52°	52°–54°	49°–53°	49°–54°
Saponification-values.....	21.8%	22.0%	22.2%	21.9%	22.1%
Iodine-value	11.9%	13.8%	13.7%	12.5%	13%
Hehner-value	89%	90%	90.5%	89.5%	90%
Sp. gr. at 15° C.....	0.979	0.980	0.981	0.977	0.978
M. P. of fatty acids	54°	55°	55°	54°	56°

The author expresses the opinion that this systematic increase in the iodine value of Japan wax is due to the introduction of a certain proportion of "perilla oil," which, according to Lewkowitsch ("Fats and oils"), is used for the more complete separation of the wax from the press residue, or even the ground berries, of the different species of *Rhus* yielding it.—Chem. & Drugg., Jan. 7, 1905, 34.

Newfoundland Cod-Liver Oil—Method of Freezing Out Stearin, Etc.—H. C. Thomson describes a visit to Newfoundland and of the preparation

of cod-liver oil, which is now conducted in the principal manufactories, notably that of Mr. W. A. Munn, by the more scientific Norwegian method. From this it appears that the oil is extracted, under certain modern precaution, by the fishermen all around the coast, many of whom Mr. Munn has supplied with the proper "steamers" (steam-jacketed pans), and is sent on by them in casks to the factory, where it is carefully tested to see that it is a pure and well-made oil, before it is subjected to the freezing treatment. When run out from the steamer the oil should be filtered through light canvas bags, or if at all cloudy, through layers of charcoal, and if possible should be put up in tins or glass, and not in casks, as it is apt to acquire taste and color from the wood. The oil thus made, though a good, pure oil, still contains a considerable amount of stearin and solid fats, which are deposited at a low temperature and cause the oil to congeal. In order to extract these and still further improve the quality of the oil, the Norwegians have for many years subjected it to a temperature of a few degrees below freezing point, 19° F. being found to be the most suitable. This temperature can easily be obtained by the use of ice and salt, and the requisite plant is cheaper and better adapted to the country than a dry cold air machine would be. The most convenient way to apply the cold is to have a number of galvanized-iron cylinders suspended from the ceiling 2½ feet apart in a room 7 feet high. A rackwork is also attached to the ceiling, from which light canvas bags, in rows of three, one under the other, are suspended, with plates of tin under the lowest row, and a cooling-tank for collecting the oil. The only other requisites are the presses for separating the residue of the oil from the stearin which cannot be obtained by filtration through the bags. The filtration through the bags is slow and cannot be hurried, as the room must be kept at the same temperature, 19° F., all the time. It generally takes the oil from three to four days to drip through the bags, under natural pressure; and it must be left for some time first in the cooling-tanks, and thoroughly congealed before it is placed in the bags. Newfoundland has already made great strides in the production of cod-liver oil which can be relied on for medicinal purposes, and there can be little doubt that, with a more general adoption of scientific methods, Newfoundland manufacturers will be fully able to compete with their Norwegian rivals.—Chem. & Drugg., Febr. 11, 1905, 255.

Cod-Liver Oil—Characters Demanded for the Medicinal Product.—G. Giese qualifies the characters of medicinal cod-liver oil as follows: Color, odor and taste proving satisfactory, the specific gravity should range between 0.926 and 0.931, and this specific gravity should be coincident with both the iodine number and saponification number required by the Pharm. Germ.; for, while by skillful adulteration the one or the other of these constants may coincide with that of specific gravity, it is not likely that an adulterant or substitute can be found in which all these constants

coincide with the official requirements. The color reactions are more subjective in their interpretation and less reliable. Nevertheless, they are of value in connection with the determination of the preceding qualities and constants. The violet-red color, changing to brown, when a solution of 1 drop of the oil in 20 drops of bisulphide of carbon is shaken with 1 drop of sulphuric acid, indicates the presence of lipochrome—the characteristic coloring matter of cod-liver oil—and of cholesterin; while true cod-liver oil is well differentiated from seal oil, Japanese and other foreign fish oils, by the red color produced at the points of contact, changing on shaking to bright rose red and finally to lemon-yellow, when 3 drops of fuming nitric acid (sp. gr. 1.5) are added to 15 drops of the cod-liver oil—the foreign oils generally producing a brown instead of a red coloration. The elaidin test of the Pharm. Germ. is of value only for the detection of foreign oils other than seal or fish oils. One of the simplest tests consists in the exposure of about 10 Cc. of the oil to refrigeration in melting ice. The pure, white cod-liver oils remain clear or show at most only faint turbidity, while other fish oils become decidedly turbid, or become more or less congealed. The author has met with only few yellow oils that conform to this test. Medicinal cod-liver oil should conform to *all* the requirements here described.—Pharm. Ztg., *49*, No. 52 (1904), 542.

Refined Cod-Liver Oil—Proposed Description for the B. P.—John C. Umney and C. T. Bennett, after a review of the character and tests of cod-liver oil, with special reference to some cases recently decided in the British courts under the Sale of Food and Drugs Act, recommend the following monograph for the next British Pharmacopœia, which includes certain physical constants considered of importance in consonance with present day knowledge, as well as the sulphuric acid test on the lines of the German Pharmacopœia, the iodine value, a limit of free acidity, and saponification value:

Oleum Morrhuæ Purificatum—Refined Cod-Liver Oil.—The oil extracted from the fresh liver of the cod, *Gadus morrhua*, Linn., by the application of a temperature not exceeding 180° F. (82.3° C.), and from which solid fat has been separated by filtration at about 23° F. (—5° C.). *Characters and Tests.*—Pale yellow, with a slight fishy but not rancid odor and a bland fishy taste. Specific gravity, 0.925 to 0.931. No solid fat should separate on exposure of the oil for two hours to a temperature of 32° F. (0° C.). Readily soluble in ether, chloroform, and carbon bisulphide, and slightly soluble in alcohol (90 per cent.). Refractive index (at 20° C.) not below 1.4790. Saponification-value, 179 to 198; iodine-value (eighteen hours' absorption), 154 to 170. Free fatty acids (calculated as oleic) should not exceed 1.5 per cent. Melting-point of fatty acids, 23° to 26° C. Unsaponifiable matter not exceeding 1.5 per cent. One Cc. of the oil dissolved in 10 Cc. of carbon bisulphide should give a

violet-blue color with one drop of sulphuric acid.—Chem. and Drugg., Jan. 28, 1905, 129–130.

Cod-Liver Oil Standards—Additional Figures.—Supplementing the figures given by Umney and Bennett in the paper referred to in the preceding abstract, Ernest J. Parry gives the tabulated results of his own examinations of forty samples of cod-liver oil, typical of a much larger number which have passed through his hands during the past two years. Explanatory notes on the factors included in the table are also given, these comprising specific gravity, acidity, saponification value, unsaponifiable matter, free fatty acids, Reichert's value, refractive value, iodine value, refractive index of the oil, and the melting point, iodine value and mean molecular weight of the fatty acids. The larger number of the oils examined were of the high class, pale variety, only eight samples being of doubtful purity and of somewhat rank odor.

Cod-Liver Oil—Color Test of the B. P.—E. W. Mann, in view of the numerous disputes concerning the official (B. P.) color test for cod-liver oil—a violet coloration developed by a drop of sulphuric acid when added to a few drops of the oil on a porcelain slab—and the statements concerning the effect of hydrolysis, etc., on the color reactions given by the oil, prepared three samples, as follows, which were taken as representative of varying conditions of the oil:

1. Selected livers were taken, carefully freed from gall, and the oil rendered at a temperature not exceeding 80° C. in three portions, each of which was carefully refined and filtered. The amount of free fatty acid, calculated as oleic, ranged from 0.19 to 0.25 per cent.

2. Selected livers were placed in a barrel and allowed to stand in a warm place for three months. At the end of that time the livers were much decomposed and a brownish oil had risen to the surface. This was removed and treated as before. Free fatty acid was 5.02 per cent.

3. A sample of Norwegian oil, season 1903, was prepared in the factory of Messrs. Southall Brothers & Barclay, Ltd., and contained 0.71 per cent. of free acid.

Subjected to the sulphuric-acid test, samples 1 and 3 gave the orthodox coloration; sample 2 gave a violet coloration, but the purity of the color was marred by a strong brown shade. With Meyer's test, no difference could be detected between the three. The conclusions to be drawn from these experiments, coupled with the author's own experience, seem to be that while, given a genuine oil prepared from fresh livers, the correct violet color of the B. P. test will always be obtained, it does not by any means follow that the converse of this is true; for a sample may be largely adulterated or even consist wholly of foreign oil and yet give a perfect sulphuric-acid reaction.—Chem. and Drugg., Nov. 26, 1904, 883.

Cod-Liver Oil—Kremel's Nitric Acid Reaction of Doubtful Value.—

Schamelhout observes that since Kremel's color-reaction for the identification of cod-liver oil first appeared in 1884, many different modifications of the method of manipulation have been given, which are found to affect the results obtainable. The most definite reaction is the fire-red or rose tint obtained when fifteen drops of the oil is agitated with three drops of fuming nitric acid. By modifying these proportions, or by applying the test in other ways, such as floating the oil in a small quantity of acid on a watch glass, other colors or shades are obtained. At the best, the test is of little value to detect admixture with cod-liver oil, since a good reaction may be obtained with oil containing 15 per cent. of skate-liver oil, 30 per cent. of vaseline oil or of sesame oil. Nor is it of much value in differentiating cod-liver from other fish oils.—Pharm. Journ., April 8, 1905, 513; from Répertoire (3), *17* (1905), 116.

Cod-Liver Oil—Possible Adulteration with Japanese Fish Oil.—Dr. G. Weigel calls attention to the recent importation into Europe of Japanese fish oil of a quality that renders its substitution or adulteration of cod-liver oil quite probable, comparing favorably with the latter in color and transparency as well as in the mild and agreeable taste and odor. In its constants, also—sp. gr., 0.9255, iodine number, 145.8, and saponification number, 188.1—it agrees with normal cod-liver oil; but its color reactions with bisulphide of carbon and sulphuric acid, as also with fuming nitric acid, identifies it as

Japanese Fish Oil.—If dissolved in bisulphide of carbon and treated with conc. sulphuric acid, a violet-blue color, soon changing to grey, is produced, while fuming nitric acid produces a beautiful violet-blue color, gradually changing to brown. The latter reaction is so intense, that it clearly manifests itself in an admixture of 5 to 10 per cent. of the fish oil with genuine Lofoten cod-liver oil, covering the rose-red color, characteristic of the latter with this reagent, completely.—Pharm. Centralh., *45*, No. 29 (July 21, 1904), 553.

Cod-Liver Oil—Aromatic Flavoring.—O. Kreyhelig recommends the following flavoring mixture for cod-liver oil: Tincture of roasted coffee with saccharin, 150.0; castor oil, 150.0; cod-liver oil, 100.0; oil of Ceylon cinnamon, 5.0; acetic ether, 1.0. Of this flavoring 8 to 10 Gm. are added to 90.0 of cod-liver oil, producing a clear mixture. The

Tincture of Roasted Coffee with Saccharin (Tinct. Coff. Tost. Saccharin) is obtained by digesting 20.0 powdered roasted coffee and 1.5 saccharin in 100.0 absolute alcohol and filtering.—Pharm. Ztg., *49*, No. 101 (Dec. 17, 1904), 1074.

India Isinglass—Zoölogical Origin.—E. M. Holmes mentions that in 1878, when the "Museum Catalogue" was published, the late Dr. Day, who was an authority on the fishes of India, identified the specimens of India isinglass then in the Museum of the British Pharmaceutical Society as follows: From

Polynemus indicus, Shaw—Bengal pure isinglass, East Indian pure isinglass, and Penang short-tongue isinglass. From

Arius species—Penang oyster isinglass. From

Belone megalostrigma, Cuv. and Val.—Penang long-pipe isinglass. From

Polynemus plebejus, Gm.—Penang long-tongue isinglass, Penang leaf isinglass, Bombay long-tongue isinglass and East Indian rolled leaf isinglass. To these Mr. Holmes now adds the following, with the authorities named :

Silunda ganglia. The air bladders are collected for isinglass, according to Sir Geo. Watts (in "A Provisional List of Notes and References to the Chief Indian Animal Products," Simla, 1902).

Sciaena lucida, *Otolithus maculatus* and *Anquilla pekininensis* yield the Chinese isinglass, known as "Ju-ka," according to Beauregard (in "Nat. Med. Zoöl.," 1901). Possibly the first and second of these (or allied species of that genus) may yield the Saigen leaf isinglass of the British market.

Bola (Sciaenidæ) and possibly *Polynemus tetradactylus* and *P. quadrifilis*, Cuv., are suggested as the sources of Indian isinglass by Dr. Forbes Royle (in "Prod. of Isinglass Along the Coasts of India," 1842).—Pharm. Journ., Dec. 17, 1904, 891.

Urine of a Tortoise—Examination.—L. de Koningh has subjected a specimen of the urine of a tortoise to chemical examination. The specimen was clear, had a faint acid reaction, and yielded 1.03 per cent. of solids, of which 0.63 per cent. was ash (nitrated). The latter was slightly phosphatic. On heating the residue, a slightly aromatic, but not at all offensive odor, was noticed. The urine gave no precipitate with picric acid, but a strong darkening on applying the bismuth test for sugar ; the usual precipitate was not noticed. On standing two days the sides of the test-tube were coated with a transparent crystalline deposit, which was found insoluble in strong acetic acid, but gave the murexid reaction.—Chem. News, Aug. 5, 1904, 64.

Snakes' Eggs—Constituents.—According to the investigations of J. Galimard, the eggs of the common ringed snake (*Tropidonotus natans*) are found to contain 58.94 per cent. of water and soluble salts, 21.81 per cent. of lecithins and fat, 0.72 per cent. of albumin soluble in H_2SO_4, 5.81 of albumin soluble in NaOH, and 12.71 per cent. of crude keratin. This keratin is unaffected by pepsin, and is insoluble in all solvents, acid or alkaline. When decomposed by prolonged boiling with 30 per cent. sulphuric acid it gave arginine, lysine, histidine, tyrosine, leucine (the last predominating) ; also amido acids and humid products. Keratins generally contain much sulphur, and yield about 4 per cent. of tyrosine ; this snake's egg keratin contained barely any sulphur, and only gave 1.5 per cent. of tyrosine.—Pharm. Journ. May 27, 1905, 789 ; from Journ. Pharm. Chim. (6) *21* (1905) 499.

Civet—Adulteration.—E. J. Parry mentions that at the present time it is hard to find much genuine civet on the market. He has examined a considerable number of samples recently, and found all of them practically to be adulterated with some vegetable carbohydrate matter. Some of the samples also contained petroleum, and cocoa-nut fat in addition to the carbohydrate matter. The latter does not reduce Fehling's solution, or only to a slight extent, possibly due to hydrolysis.—Chem. & Drugg. July 30, 1904, 168.

INORGANIC CHEMISTRY.

General Subjects.

Radium Radiation—Influence on Atmospheric Oxidation Similar to that of Sunlight.—Henry J. Horstman Fenton has pointed out in a previous communication that the oxidation of certain hydroxy-compounds, such as tartaric acid or glycol in presence of iron, may be brought about by atmospheric oxygen in presence of sunlight, and that the products are the same as those obtained when hydrogen dioxide is employed as oxidizing agent. It is now found that the influence of radiations from radium bromide may, in certain cases, produce effects similar in this respect to those obtained by exposure to sunlight. A solution of tartaric acid, for example, containing a small quantity of ferrous tartrate, was divided into two parts and kept in the dark in presence of air, one of the tubes being placed directly over a specimen of radium bromide. On testing the solutions after a day or two with phenylhydrazine acetate a very striking difference was observed in the results, the exposed solution giving the larger yield of Nastvogel's osazone.—Chem. News, Sept. 30, 1904, 168.

Radio-Activity—Recent Knowledge and Literature on the Subject.—W. Harrison Martindale has contributed a highly interesting paper on radio-activity, in which he makes the latest information on the subject available for convenient reference. He mentions that the property of radio-activity was in reality first discovered by Becquerel, in 1896, for uranium-containing minerals and chemicals of every kind, and discusses the proposition that the properties of radium are due to its atom breaking down, and that the radium atom itself is the offspring of uranium. The author adduces the evidence in favor of radium breaking down, incidentally quoting many of the startling and unrealizable calculations about how long radium will last and what it does in the way of heating. After a brief reference to Mendeléeff's skepticism about the changing atom, he proceeds to discuss the *alpha*, *beta*,

and *gamma* rays and their properties, treating these as distinct from the emanation from radium of a gaseous body which is radio-active, and from which Ramsay and Soddy obtained the helium spectrum. Further, the author's paper discusses the claims made for polonium, Blondlot's rays, the radio-activity of the air, of mineral waters and minerals, and the therapeutic uses of radium-rays, the latter subject being illustrated with numerous cuts of apparatus used in testing and applying radium.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 489–503.

Delta Rays—A New Type of Radio-Active Radiation.—At a meeting of the Royal Institution (March 18, 1905), Professor J. J. Thomson announced his discovery of delta rays, which are a fourth and new type of radiation from radio-active substances. The new rays fall in with the disintegration theory, and suffice to explain the puzzling behavior of polonium, which has hitherto been supposed to emit alpha particles only; however, all previous attempts to accumulate their positive charges in a similar manner to that which has been done for beta rays, by using Strath's electroscope, have failed. Professor Thomson has proved that polonium gives off delta rays in addition to the positively charged alpha rays. The delta rays are composed of very minute corpuscles carrying a negative charge. These two types, acting simultaneously on an electroscope, tend to neutralize each other, this accounting for the anomalous results which previous experimenters have obtained. By using a strong magnetic field in a vacuum tube the negative delta rays can be curled backwards so that they do not reach the electroscope (which is in the same vacuum tube); the positive alpha rays, having a much greater mass, are distorted but slightly, and as the curvature produced by the field is in the opposite direction, the isolated alpha rays can now discharge the negatively charged electroscope and so prove that they do carry a positive charge. The mass of the delta particles is about one-thousandth of the mass of an atom of hydrogen. They are therefore like the corpuscles constituting the beta rays (cathode rays), from which they appear to differ in having a much smaller velocity; therefore of all the four known types the delta rays have the least penetration, only being able to pass through a few millimeters of air. At present, delta rays have been detected in polonium and uranium, but it is highly probable that they are associated with other sources of alpha rays.—Chem. and Drugg., Mar. 25, 1905, 474.

Radio-Active Minerals—Additional List.—In a former paper, R. J. Strutt had drawn attention to the fact that all thorium minerals, so far as could be ascertained, appeared to contain uranium and radium. Since then he has examined a number of additional minerals, with results that have been quite confirmatory of his original conclusion, contenting himself, however, with determining the thorium and radium, for it may now be considered proved that radium is a product of uranium, and it is much easier to establish the presence of radium by its emanation than to detect

uranium by chemical analysis. The experimental methods explained in the former paper were employed. The results are as follows:

Mineral.	Locality.	Thorium, oxide, per cent.	Radium, millionths of 1 per cent.
Thorite	Ceylon	61.0	1.00
Thorite	Brevig, Sweden	53.9	0.81
Monazite	Johannesberg	5.94	1.06
Alvite	Raade Moss, Norway	4.95	1.81
Xenotime	Raade Moss, Norway	3.89	0.90
Monazite	North Carolina *	3.79	0.53
Monazite	Nigeria	2.98	3.78
Anerodite?	Ceylon	2.27	9.80
Monazite	Malay Straits	1.53	4.02
Fergusonite	?	1.31	26.7
Malacone	Hitteroe, Norway	1.15	1.40
Allanite	Amherst Co., Va.	0.492	1.08
Yttrotantalite	Ytterby, Sweden	0.437	5.56
Polycrase	?	0.334	0.36
Zircon	North Carolina	0.307	0.34
Zircon	Virginia	0.217	0.52

—Chem. News, June 30, 1905, 299.

Radio-Active Mercury Ores—Occurrence in Servia.—S. M. Losanitsch has recently examined various Servian ores and other minerals for radio-activity, and found that native cinnabarytes from two different places (Avala and Bare) have a decided radio-active effect upon the photographic plates. In the basis of his experiments, which are outlined in a preliminary paper, he expresses the opinion that the radio-active constituent of the ore is a radio-mercury, and hopes to confirm this opinion by experiments which he proposes to perform very shortly.—Chem. News, Oct. 28, 1904, 218; from Berichte, *37* (1904), 2904.

Actinium—Probable Identity with "Emanium."—Several years after A. Debierne's first publication on actinium, M. Giesel announced the existence of a radio-active substance which he called "emanium" (see Proceedings, 1904, 765). The striking analogy between the properties of this substance and those of actinium led the author to suppose that they might be identical. He, therefore, in conjunction with M. Giesel and Mme. Curie, made several comparative experiments upon the phenomena of phosphorescence produced by emanations from emanium and actinium, and obtained identical results for the two substances. Miss Brooks has also found the same number for the time constant for decrease of radio-activity produced by emanium as the author had previously given for actinium. Hence the two substances must be identical.—Chem. News, Nov. 4, 1904, 232; from Compt. rend., *134*, No. 14, October 3, 1904.

* This consisted of pure grains of monazite, picked out from the commercial sand.

Emanium—Differences from Actinium.—F. Giesel, although sharing Debierne's opinions in general as regards the identity of emanium and actinium, states that there are still two facts which might point to a difference between the two substances. Thus the activity of the emanium induction falls to half its value every 34.4 minutes. As Debierne gives forty minutes for actinium induction, a considerable difference exists. Secondly, the three lines which indicate the phosphorescence light of the author's preparation in the spectroscope have not been found in the actinium preparations. It is therefore yet to be seen whether actinium and emanium are similar in every respect, and until this is proved the author thinks it advisable to retain the name emanium.—Chem. News, Nov. 25, 1904, 259.

Metallic Oxides— Convenient Method of Detection.—C. R. C. Tichborne suggests the following convenient method for the detection of metallic oxides: The suspected substance is triturated in a mortar or digested in a test-tube for half an hour, shaking occasionally, with a 10 per cent. solution of sodium bicarbonate and the mixture filtered. The filtrate will give a red color on the addition of phenolphthalein if a basic oxide is present. This reaction is given by PbO, Ag_2O, HgO, Cu_2O, Bi_2O_3, SnO_2, Sb_2O_3, FeO, Fe_3O_4, MnO, ZnO. The following do not give it: Pb_3O_4, Hg_2O, CuO, Al_2O_3, Fe_2O_3, MnO_2. The following equation illustrates the reaction:

$$MO + 2NaHCO_3 = Na_2CO_3 + MCO_3 + H_2O.$$

The solution of sodium bicarbonate must be neutral to phenolphthalein; if it gives a red color with this reagent a few drops of dilute nitric acid should be added before applying the test.—Pharm. Journ., March 25, 1905, 442; from Sci. Proc. Roy. Dublin Soc. X (II), 331.

Ash—Method of Determination in Vegetable Substances.—E. Gutzeit recommends the following method for ash-determination in vegetable substances, which years ago was employed by Ritthausen in his albumen examinations: The finely powdered substance is intimately mixed with a known weight of freshly calcined basic calcium phosphate (which see under "Alkaline Earths") and heated gently in an open platinum crucible until the organic substance is carbonized; the heat is then moderately increased, and the mixture calcined, towards the end with the crucible loosely covered, until the residue becomes perfectly white. The increase in weight of the capsule and calcium phosphate gives the quantity of ash, which retains neither finely divided carbon nor carbonic dioxide. The whole operation may be completed within one hour.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 474; from Chem. Ztg., 1905, No. 40.

OXYGEN.

Active Oxygen—Method of Determination in Inorganic Persulphate.—In inorganic persulphates the active oxygen is determined by heating a weighed amount of the persulphate with a solution of Mohr's salt and titra-

ting the unoxidized part with $\frac{N}{10}$ permanganate. This method cannot be used for organic persulphates, for even supposing that Mohr's salt is readily oxidized the excess cannot be titrated with permanganate on account of the presence of the organic substance. A. Wolff and R. Wolffenstein have therefore devised a method to obviate this difficulty, which depends on the oxidation of sulphurous to sulphuric acid: A saturated aqueous solution of sulphurous acid, to which some barium chloride had been added, was filtered and heated in an Erlenmeyer flask with a weighed quantity of persulphate and some hydrochloric acid. On cooling, the $BaSO_4$ formed was filtered off and weighed: $H_2S_2O_8 + SO_2 + 2H_2O = 3H_2SO_4$. In calculating the active oxygen it must be remembered that the available oxygen is only responsible for the formation of one-third of the total $BaSO_4$ obtained, as shown by the equation.—Chem. News, Nov. 4, 1904, 233; from Berichte, *37*, No. 13, 1904.

HYDROGEN.

Hydrogen Peroxide—Colorimetric Determination.—According to P. Planès a rough-and-ready test for the valuation of hydrogen peroxide may be made colorimetrically by matching the tint produced by the iodine liberated when a known quantity of the peroxide is allowed to react, in the presence of sulphuric acid, on potassium iodide. The sample to be tested is diluted with 9 parts of water; 5 Cc. of the dilution is treated with 3 Cc. of 10 per cent. potassium iodide solution and 1 Cc. 8 per cent. sulphuric acid, in a suitable tube, standard, and the color matched against $\frac{N}{10}$ iodine solution in another similar tube; 1.8 Cc. of the standard solution is equivalent to 1 Cc. of oxygen.—Pharm. Journ., Jan. 28, 1905, 113; from Journ. de Pharm. et Chim., 1904, *20*, 538.

Water—Purification in Reservoirs by Means of Copper.—Dr. George T. Moore, in an address given before the American Philosophical Society (Oct. 21, 1904) discusses a new method for the purification of water, which is based on the observation that the disagreeable odors and tastes of some water supplies is due to the formation and presence in them of certain forms of *Algæ*, and that these are destroyed completely by minute quantities of copper, as little as one part of copper in one million and even fifty million parts of water being sufficient to kill the unicellular and filamentous algæ, while multicellular plants, whose cells are as delicate in structure as those of the algæ are not affected. The quantity of copper introduced is so small as to be negligible in so far as its potability is concerned, for it has, particularly in recent years, been abundantly demonstrated that copper can be taken in comparatively large doses without inconvenience or injury. Within the last four or five months over fifty water supplies throughout the country, with reservoirs varying from a few to hundreds of millions of gallons, which for years have been rendered unfit for use because of algal pollution, have been successfully cleared up with one or

two applications of copper sulphate at a dilution of from one to fifty millions. It would seem from this that we are justified in believing that the method is efficient, and accomplishes something which, until it was introduced, had been considered one of the unsolved problems in water-supply work. Whether or not the water is harmless the author does not propose to discuss. It is probable that there will always be a certain amount of opposition to the use of copper for the purification of water, just as there is to vaccination or antitoxin, but as more and more cases are added to the list of supplies successfully treated without harm to the consumer, this aspect of the question will disappear.—Amer. Journ. Pharm., December, 1904, 553–564.

Water—Effect of the Copper Treatment on Pathogenic Organisms.—Henry Kraemer records the character and results of experiments conducted in the microscopic laboratory of the Philadelphia College of Pharmacy for the purposes of throwing some further light on the action of copper in the purification of water supplies containing pathogenic organisms, and its efficiency in reducing the number of micro-organisms in drinking-water. From the experiments so far conducted the author draws the following conclusions: (1) The intestinal bacteria, like colon and typhoid, are completely destroyed by placing clear copper in the water containing them. (2) The effects of colloidal copper and copper sulphate in the purification of drinking-water are in a quantitative sense much like filtration, only the organisms are completely destroyed. (3) Pending the introduction of the copper treatment of water on a large scale, the householder may avail himself of a method for the purification of drinking-water by the use of strips of copper foil about 3½ inches square to each quart of water, this being allowed to stand over night, or from 6 to 8 hours, at the ordinary temperature, and then drawn off or the copper removed.—Amer. Journ. Pharm., Dec., 1904, 574–579.

In a second, very comprehensive paper, Professor Kraemer reviews and discusses the entire field of research that has bearing upon the copper treatment of drinking-water, with particular reference to its use for destroying typhoid organisms and the effects of copper on man, considering his subjects under the following heads: The distribution of typhoid organisms; the removal or destruction of typhoid organisms in food and water; the effect of copper on lower animals and plants; the effect of water treated with copper on man; the elimination of copper from water; the occurrence of copper in foods; and the effects of foods containing copper on man. The conclusions arrived at are given as follows:

(1) It is pretty well established that the typhoid organism is disseminated not only through water, but also through air and food, and may retain the vitality for a considerable period of time.

(2) Typhoid organisms in water are eliminated by filtration, boiling and certain biochemical methods. Of the latter, the use of copper, as pro-

posed by Moore and Kellerman, is probably the most efficient and at the same time most practicable.

(3) While exceedingly minute quantities of copper in solution are toxic to certain unicellular organisms, as bacteria, it is safe to assume that the higher plants and animals, including man, are unaffected by solutions containing the same or even larger amounts of copper.

(4) There being a number of factors which tend to eliminate copper from its solutions, it is hardly likely that there would be any copper in solution by the time the water from a reservoir reached the consumer, if the treatment of the reservoir were in competent hands.

(5) Many plants contain relatively large quantities of copper, and when these are used as food some of the copper is taken up by the animal organism, but there is no record of any ill effects from copper so consumed.—Amer. Journ. Pharm., June, 1905, 265-279.

HALOGENS.

Chlorinated Lime—Yield from Slaked Lime, Etc.—L. Reuter calls attention to a statement in Census Bulletin No. 210, on "Chemicals and Allied Products," that burned lime used in the manufacture of bleaching powder is "so slaked as to contain from 24.5 to 25.5 per cent. of water." This statement is likely to be misinterpreted, for while it is correct that 100 parts of calcium hydroxide of 100 per cent. always contain the equivalent of 24.3 per cent. of H_2O, the H_2O is chemically combined and cannot be considered as moisture or "water." The composition of slaked lime as actually used in the manufacture of bleaching powder is given by the author in three examples, which agree fairly well with each other, the following being that of the first one in the list: $Ca(OH)_2$, 94.92; $CaCO_3$, 1.87; water, 1.47. Loss on ignition, 25.29 per cent. In practice, therefore, there is an excess of water, as such, of less than 1½ per cent. With regard to the yield of bleaching powder, which is given in the same Bulletin as being 150 lbs. from 100 lbs. of good lime, this depends on the quality of the product. The statement is correct if the figure 150 refers to the bleaching powder containing 34.95 per cent. of available chlorine. If this percentage be lower or higher, the yield must necessarily also be smaller or larger.—Pharm. Rev., April, 1905, 125-127.

Chlorinated Lime—Pink Color Due to Iron.—The pink or rose color occasionally observed in chlorinated lime has hitherto been attributed to the presence of manganese, introduced through the agency of the chlorine prepared by the intervention of manganese oxide in the well-known way. Experiments now made by Tarugi, however, have shown that this assumption is erroneous, and that the rose color of chlorinated lime is due to the formation of a lime salt of ferric acid. This color is developed in chlorinated lime, which has been ascertained to be free from iron, by adding small quantities of an iron salt to it.—Pharm. Ztg., *50*, No. 18 (Mar. 4, 1905), 189; from Chem. Centralbl., 1905, I, No. 8.

Bromides—Presence of Organic Impurities.—In the course of the examination of commercial bromides, Henrik Enell was surprised to find that smaller quantities of silver nitrate were required for complete precipitation than are theoretically necessary, the larger figure being conceded in nearly all pharmacopœias which admit the presence of from 1 to 2 per cent. of chloride. He found this minim to result in a sample of ammonium bromide to amount to 1.27 per cent.; in another it was insignificant. In the first case he determined the presence of 1.2 per cent. of organic matter, and this sample became decidedly grey on heating, while the second sample was rendered only faintly greyish. In the same manner the freedom from organic matter was determined in one sample of sodium bromide, which remained white on heating, while another sample of this salt, and also a sample of potassium bromide contained some organic matter, although not as much as the first sample of ammonium bromide, and both of the last-named samples became more or less grey on heating. Tests made to determine the presence of chloride were practically in the negative in all cases except in the sample of sodium bromide which was free from organic matter.—Pharm. Ztg., *49*, No. 55 (July 9, 1904), 576–577.

Potassium Bromide—Commercial Quality.—Francis J. Smith records the results of the examination of a large number of samples of potassium bromide of different manufacture, extending over a period of eighteen months. He finds that chloride and carbonate are generally the only impurities met with, and of these the chloride is usually present in the larger proportion, although a few samples contained an excessive amount of carbonate. The results are in the main favorable, however, the products of five manufactures out of six represented in the table accompanying the author's paper being, practically, uniformly reliable—two samples in one case and one in another, being the only ones found sufficiently impure to be rejected. In the case of the sixth manufacturer, a large proportion of the samples had to be rejected.—Amer. Journ. Pharm., Aug. 1904, 368–369.

Iodine—Atomic Weight.—Two years ago Ladenburg described a new method of preparing pure iodine, depending upon the different solubilities of the silver haloid salts in ammonia, and with the iodine thus obtained he carried out atomic weight determinations, finding, as the mean of three experiments, I = 126.960 (O = 16). The value found by Stas, using three different methods, is 126.85, and both these numbers have been confirmed by other observers—the one by Scott and the other by Marignac. P. Koethner and E. Auer have now undertaken a particularly exhaustive and careful research to explain this difference and establish the true atomic weight. They found that Ladenburg's method, resting on the determination of the ratio of AgI to AgCl by decomposition of AgI in a current of chlorine, was liable to error, but not sufficient to account for the difference between his and Stas' number. Using the same method, and taking all

precautions, they found, as the mean of eight experiments, that the atomic weight is 126.936. However, using a different specimen of silver iodide, which was as pure as Stas' preparation, they obtained a value practically identical with his. Hence they concluded that the treatment of silver iodide with ammonia really purified it, and elaborated another method of obtaining perfectly pure iodine, viz., the distillation of ethyl iodide, which boils at 72° C., while ethyl chloride boils at 12° C., and the bromide at 38° C. The pure ethyl iodide was carefully fractionated, and the hydrogen iodide obtained from it was precipitated with a weighed quantity of silver. This synthesis gave I = 125.978. Finally, they synthesized silver iodide by igniting silver in a current of iodine—a method which undoubtedly gives the lowest limit of the atomic weight. This gave 126.963 (vacuum). Thus the authors believe that they may safely say definitely that the atomic weight of iodine is not less than 126.963.—Chem. News, Aug. 19, 1904, 94; from Berichte, *37* (1904), No. 11.

Iodine—Alkalimetric Method of Estimation.—G. Barbieri proposes the following method for the estimation of iodine, which is based on its behavior to alkalies and hydrogen peroxide, and yields reliable figures: To 30 Cc. of $\frac{N}{10}$ sodium-hydroxide solution, in a 200 Cc. flask, 30–40 Cc. of a perfectly pure, neutral 1 per cent. solution of hydrogen peroxide are added, and then 25 Cc. of the iodine solution under examination. The perfectly colorless solution produced is heated a few minutes at 100° C. to remove the excess of H_2O_2, and then titrated with $\frac{N}{10}$ sulphuric acid and methyl-orange. The quantity of alkali consumed, multiplied by the factor 3.1665, gives the quantity of iodine in 25 Cc. of the solution examined.—Pharm. Ztg., *50*, No. 27 (April 5, 1905), 281; from Bull. Chim. Farm., *44*, 6–7.

Iodine—Determination of Chlorine and Bromine Content.—R. R. Tatlock and R. T. Thomson recommend the following process for determining the chlorine and bromine in iodine: Five Gm. of the sample is treated with 50 Cc. of water, and zinc, finely granulated, or in the form of dust, is added gradually with shaking until the iodine is all combined, keeping quite cool. The solution is filtered, the residue washed, and 3.5 Gm. of sodium nitrite added. The mixture is then carefully acidulated with dilute sulphuric acid, when the iodine is precipitated, filtered off, and washed with water. The remainder of the iodine is removed by shaking with benzene twice, adding a little sodium nitrite and sulphuric acid between the shakings to ensure complete liberation. The chlorine and bromine are precipitated by the addition of silver nitrate and nitric acid. The precipitate is treated with a solution of 2 Gm. of silver nitrate, 10 Cc. of ammonia (.830), and 90 Cc. of water, which dissolves the chloride; the residual bromide is weighed, and the chloride precipitated with nitric acid and weighed. The bromide precipitate is tested for iodine by decomposing with zinc and sulphuric acid, filtering, adding a few drops of

chlorine water, and shaking with a little carbon bisulphide.—Pharm. Journ., Mar. 25, 1905, 441 ; from Journ. Soc. Chem. Ind., *24* (1905), 187.

Calcium Fluoride—Production in Crystalline Form.—According to Defascqs, calcium fluoride may be conveniently obtained in a crystalline form, either as cubes or octahedra, by fusing together a mixture of manganese fluoride, 1, and calcium chloride, 10, at a temperature between 1,000–1,200° C. for two hours. On allowing the fused mass to cool slowly, and treating it first with water, then with very dilute hydrochloric acid, calcium fluoride is obtained in perfectly white crystals, which are octahedral if the fusion has taken place between 800–1,000° C., and perfect cubes if the temperature has been raised to 1,200–1,400° C. In employing mixtures of the same salts in other proportions, such as magnesium fluoride, 1, and calcium chloride, 3 or 5, the product was not pure calcium fluoride, but a mixture of that salt with calcium fluorochloride according to the equation :

$$MnF_2 + 2CaCl_2 = CaF_2CaCl_2 + MnCl_2.$$

A similar reaction takes place with the bromides, chlorides, and iodides of barium or strontium and manganese fluoride. In these instances the fused mass is washed with alcohol (95 per cent.) instead of with water. The crystalline form of the fluorochlorides has not yet been determined. —Pharm. Journ., Dec. 3, 1904, 814 ; from Comptes rend., 137, 1,251.

SULPHUR.

Commercial Sulphur—Assay.—J. Cerute recommends aniline, having a boiling-point of 180° to 185° C., for the valuation of commercial sulphur, as follows : One Gm. of the sample is placed on a tared filter and extracted with 50 Cc. of aniline heated to 120° to 130° C. The filter is then washed with alcohol, dried, and the insoluble matter weighed. The filtrate may be treated with hydrochloric acid, when the dissolved sulphur is precipitated. This may be collected and weighed, after drying over sulphuric acid.—Pharm. Journ., Sept. 3, 1904, 379 ; from Boll. Chim. Farm., through Répertoire [3], *16*, 364.

Sublimed Sulphur—Distinction from so-called "Flowers of Sulphur."—Domergue remarks that authorities differ as to the form assumed by sublimed sulphur. By some it is described as amorphous, composed of minute spheroids or utricles ; by others as crystalline. It is found that this difference in form is due to the rate of condensation of the sulphur vapor during the process of sublimation. When the operation commences the difference in temperature between the sulphur vapor and that of the atmosphere of the chamber is very considerable, so that condensation takes places suddenly and spheroidal sulphur is produced. Gradually, the temperature rises, and crystalline sublimed sulphur is formed. At a still higher temperature a portion of the sublimate is again fused to solidify on

cooling. Consequently when the subliming chamber is opened four forms of sublimed sulphur are found, the spheroidal form, a mixture of spheroids and crystalline powder, friable spongy masses of the same crystals, and solid crystalline masses without any trace of the spheroidal form. The crystalline masses are removed and the powder form sifted. The term "flowers of sulphur" should be limited to the product containing a definite amount of spheroidal or utricular variety, while "sublimed sulphur" should be the name applied to the whole sublimate after removal of the solid crystalline blocks. Since sulphur in the spheroidal form is insoluble in carbon disulphide, while the crystalline variety is readily soluble therein, commercial "flowers of sulphur," when freshly prepared, should contain not less than 33 per cent. of the insoluble form. The price of commercial sublimed sulphur is directly proportionate to the amount of insoluble sulphur or "flowers" which it contains.—Pharm. Journ., Dec. 14, 1905, 37; from Journ. de Pharm. et Chim., 1904, *20*, 493.

Sulphamide—Preparation.—To prepare sulphamide, O. Ruff saturates 400 Gm. of chloroform with ammonia gas, and into the strongly cooled liquid he lets fall, drop by drop, a mixture of 100 Gm. of chloride of sulphuryl and 100 Gm. of $CHCl_3$, taking care to stir well between each drop. This operation is stopped when all the ammonia is consumed (the drops then no longer react violently). The liquid is again saturated with ammonia, and the operations are repeated until all the SO_2Cl_2 is used up. Saturate again with ammonia, for the last time, and let stand in a well-stoppered bottle. A pasty mass is left floating on the chloroform; this latter will serve for a further operation. The pasty mass is dried in the oven at 100° C. (all traces of moisture must be guarded against in these operations), and ground in a warm mortar with warm sand; the whole is then exhausted with acetic ether free from water for four or six hours. The sulphamide then crystallizes easily from this solvent, giving a return of 8 or 9 Gm. It is fusible at 92° C.—Chem. News, Sept. 23, 1904, 161; from Berichte, *36*, 2900.

Liquefied Hydrogen Sulphide—Properties.—Atony and Magri, having completed their studies upon liquid hydrogen sulphide, give the following information concerning its properties: When pure, liquid H_2S is a colorless, transparent, very mobile fluid, which does not boil in a Dewar-flask, even when a fragment of pumice is dropped into it, nor in an ordinary test-tube, from which it is suddenly expelled. It is without action on litmus, and therefore not a dissociated body, as is also confirmed by its strong resistance to the electric current. It has strong solvent properties, dissolving besides iodine numerous organic substances, such as iodoform, nitrophenol, azobenzol, nitronaphthalin, picric acid, etc. Its chemical energy, which is so powerful in its gaseous condition or when in aqueous solution, is almost completely nullified in the liquid condition. It dissolves iodine as well as sulphurous acid anhydride, with absorption of

heat, without chemical reaction; such reaction only manifesting itself upon the addition of an ionizing substance: So, for example, if water is added to its iodine solution, when a lively reaction results. Metals which under ordinary conditions are readily attacked by H_2S, remain unaffected when immersed in the liquid compound. Mercury, for example, does not lose its metallic lustre, although it is solidified, and potassium and sodium remain equally unaffected, as are the salts of copper, silver, lead and mercury, and easily oxidizing substances, such as chromic acid, bichromate, potassium permanganate, etc. Only bromine is mentioned as an exception, bromine sulphide being formed under energetic action, and dissolving in excess of the liquid H_2S with a red color.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 770; from Chem. Ztg., 1904, No. 70.

Hydrosulphites—Nature.—The much-discussed question as to the nature of the hydrosulphites has been subjected to further experimental investigation by Baumann, Thesmar and Frossard. The view of Schützenberger that hydrosulphurous acid is to be represented by the formula H_2SO_2 receives strong confirmation. As is pointed out, the crystalline sodium salt $Na_2S_2O_4.2H_2O$ obtained by Bernthsen may be written $NaHSO_2$-$.NaHSO_3.H_2O$, and the behaviour of the mother-liquors, from which this salt separates, corresponds with this view. In fact, two formaldehyde compounds corresponding to $NaHSO_2.CH_2O.2H_2O$ and $NaHSO_3.CH_2O.$-$.H_2O$ have been separated and analyzed.—Pharm. Journ., Mar. 18, 1905, 405; from Rev. Gén. d. Matières color, *8*, 353.

Phosphorescing Metallic Sulphides—Conditions Necessary to their Production.—W. P. Jorison and W. E. Ringer communicate the results of experiments undertaken with the object of confirming and extending the researches of the late De Visser on the conditions necessary to excite phosphorescence in metallic sulphides. De Visser has found that absolutely pure barium sulphide gives no trace of phosphorescence, while pure calcium sulphide only luminesces very feebly. By the addition of small quantities of bismuth powerful phosphorescence is produced, the maximum being reached when two atoms of bismuth are present in 100,000 atoms of barium or calcium; this effect is diminished by more as well as by less bismuth. De Visser states that in order that a sulphide may be capable of phosphorescing, it must contain in solid solution a compound of another metal which is in a state of electrolytic dissociation. The most refrangible radiations of the spectrum split up the ions of the foreign metal into a large number of electrons, which, by their vibration after illumination, cause phosphorescence. De Visser examined many other metals, but discovered only a very few which could excite phosphorescence in the sulphides of calcium and barium. He thought it probable that many of these metals show invisible ultra-red or ultra-violet phosphorescence. He also found that the presence of some alkali salt in the sulphide was necessary for powerful phosphorescence, but no definite amount was required to cause maximum

phosphorescence; he supposed that the alkali salt by fusing favored the formation of the solid solution of bismuth in the calcium sulphide. Sidot's blende seems to behave in an exactly similar manner.—Chem. News. Dec. 16, 1904, 305; from Berichte, *37* (1904), No. 15.

Sulphur Chlorides—Formation and Characters of Double Compounds.—The existence of sulphur tetrachloride has been shown by physico-chemical researches, but the existence of a dichloride is so far only hypothetical. Otto Ruff has now examined chemically the formation of double compounds of sulphur tetrachloride and of the hypothetical dichloride. He found that this dichloride always behaves chemically like a strongly dissociated solution of the tetrachloride in sulphur subchloride, and is thus not a chemical compound. He never obtained compounds of sulphur dichloride, the supposed compounds of SCl_2 and $SbCl_5$ and $AsCl_3$ and the iodine compound to which Jaillard gave the formula ICl_3SCl_2 being really tetrachloride compounds. The sulphur tetrachloride for these experiments was made by the slow union of S_2Cl_2 and liquid chlorine in a closed tube. It is a yellowish-white substance, melting at $-30\frac{1}{2}°$ or $-31°$ C., giving a red liquid. It is decomposed by water almost quantitatively, giving sulphurous acid. Antimony pentachloride-sulphur tetrachloride, $SbCl_5.SCl_4$, is prepared by the addition of sulphur chloride with 68.9 per cent. chlorine to a solution of antimony pentachloride in sulphuryl chloride in the cold. Analysis gave the formula $SbCl_5.SCl_4$. It forms fine white crystalline needles easily decomposed by water. In an atmosphere of chlorine it melts in a closed tube at 125–126°, and begins to sublime at about 150° C. On heating in air it yields S_2Cl_2, Cl and $SbCl_3$. The corresponding compound, $PCl_5.SCl_4$, could not be prepared. Titanium tetrachloride-sulphur tetrachloride, $TiCl_4.SCl_4$, is prepared similarly. It has to be filtered in an atmosphere of chlorine, as it decomposes very readily. It is soluble in sulphuryl chloride, chloroform, carbon disulphide and petroleum ether; melting-point 62–64° C. It sublimes at 100°C., and does not decompose on heating in a closed tube filled with chlorine. Fine yellow crystals of tin tetrachloride-sulphur tetrachloride, $SNCl_4.2SCl_4$, are prepared by cooling a mixture of freshly-prepared sulphur chloride with 68.9 per cent. chlorine and freshly-distilled stannic chloride. It is strongly hygroscopic; melting-point 37° C. It decomposes at 40° C., the products of decomposition again combining on cooling to form yellow prismatic tablets, which are strongly refracting. A similar zirconium compound is formed, but is so unstable that the author could not isolate it. Ferric chloride-sulphur tetrachloride, $FeCl_3.SCl_4$, is prepared as a yellow crystalline precipitate by the addition of freshly-distilled sulphur chloride with 68.9 per cent. chlorine to a solution of ferric chloride in phosphorous oxychloride. Incidentally the author prepared a new compound, $2FeCl_3.POCl_3$, as a light yellow crystalline mass by dissolving freshly-sublimed ferric chloride in freshly-distilled phosphorus oxychloride and filtering off the crys-

talline mass which separates out on cooling. Iodine trichloride-sulphur tetrachloride, $2ICl_3.SCl_4$, is prepared similarly to the above double compounds. A compound of arsenic trifluoride and sulphur tetrachloride is prepared by the union of its constituents in a closed tube cooled by liquid air. It is strongly hygroscopic.—Chem. News, Jan. 20, 1905, 33; from Berichte, *37* (1904), No. 17.

Sodium Monosulphide.—Use as indicator in Sugar Titration. See *Sugar*, under "Organic Chemistry."

SELENIUM.

Colloid Selenium—Formation and Properties.—C. Paal and Carl Koch find that if an aqueous solution of selenous acid is introduced into a solution of the sodium salt of protalbinic or lysalbinic acid a precipitate forms, which is removed by the addition of soda-lye. On warming this mixture no reduction takes place, and hydrazine hydrate has no effect in alkaline solution. But if dilute hydrochloric acid is added reduction takes place, nitrogen being evolved. The liquid turns red, and on addition of more acid red flakes of the absorption compound of colloid selenium with free protalbinic or lysalbinic acid separate out. The precipitate is insoluble in water, but soluble in caustic and carbonic alkalis. As finely divided selenium is slowly dissolved in the cold by caustic alkali, forming alkali selenide, sodium carbonate was used as a solvent. The colloid solutions thus obtained were purified by dialysis. By cautious evaporation the hydrosols were obtained in the solid stable soluble form; these precipitates when dried retain their solubility in alkalis, and by this method preparations containing a high percentage of colloid selenium can be obtained. Hydroxylamine salts may be used as reduction agents instead of hydrazine hydrate.—Chem. News, May 12, 1905, 223; from Berichte, *38* (1905) No. 2.

TELLURIUM.

Colloid Tellurium—Brown and Blue Modifications.—C. Paal and Carl Koch state that tellurium dioxide when treated with hydrazine hydrate gives the brown modification of colloid tellurium, while telluric acid yields a blue-grey or steel-blue liquid hydrosol. Other reduction agents always give the brown modification. The authors have prepared the absorption compounds of colloid tellurium in combination with the sodium salt of protalbinic and lysalbinic acids, using hydrazine hydrate and hydroxylamine as reducing agents. The reaction between telluric acid, sodium protalbinic or lysalbinic acid, and hydrazine hydrate takes place in alkaline solution on warming; it begins at 40° to 50° C., and proceeds fairly rapidly on the water-bath. Only the brown modification forms, and its color does not change on boiling for a long time, or on addition of neutral salts (NaCl). Finally, after boiling for hours it is partially converted into hydrogel.

Tellurium dioxide is reduced with much more difficulty by hydrazine hydrate in neutral or alkaline solution. The reduction of telluric acid by hydroxylamine and tellurium dioxide by hydrazine hydrate in alkaline solution and in presence of a decomposition product of albumen, always gives rise to the brown modification of tellurium hydrosol. By continued boiling this is gradually changed into the blue modification. The "new modification of colloid tellurium," recently described by Gutbier and Resenscheck, is undoubtedly a mixture of the two modifications. By cautious evaporation both modifications can be obtained in the solid form, which is soluble in water, and can be heated for some time to 100° without suffering any change. On addition of acids to their aqueous solutions the absorption compounds of the two hydrosol forms with free protalbinic or lysalbinic acid separate out. The authors thus obtained stable products containing over 80 per cent. tellurium; the blue modification is less stable than the brown, and is converted into the hydrogel after it has been kept for a year in the solid state. The preparations containing the brown modification can be kept for three years, provided that they are preserved from oxidation. In preparations of either modification, if exposed to the air, the hydrosol is gradually converted into tellurium dioxide.—Chem. News, May 12, 1905, 223; from Berichte, *38* (1905), No. 2.

NITROGEN.

Nitrites—Determination in Water.—R. S. Weston has made comparative experiments with the original Griess-Warrington method of performing the naphthylamine test for nitrites (using hydrochloric acid solutions of the sulphanilic acid and *a*-naphthylamine) and the Ilosvay modification of the test (using acetic acid solutions). The conclusion drawn is that the Ilosvay method is more rapid than the original Griess-Warrington method and more delicate than the same method, using an excess of hydrochloric acid. The solutions recommended are: Sulphanilic acid, 8 Gm.; diluted acetic acid, 1,000 Cc.; and *a*-naphthylamine, 8 Gm.; diluted acetic acid, 1,000 Cc. One hundred Cc. of the water, decolorized with aluminium hydroxide if necessary, is placed in a Nessler cylinder, and a set of standards made by diluting various volumes of standard nitrite solution to 100 Cc. are placed in other cylinders, and 2 Cc. of each of the above reagents are added to each cylinder. After ten minutes the colors produced are compared.—Journ. Am. Chem. Soc., *27* (1905), 281.

Nitric Acid—Improved Diphenylamine Reaction.—G. Frerichs observes that the diphenylamine reaction for nitric acid can often not be used because of the presence of other substances, such as ferric salts, chromates, etc., which also produce colors with this reagent. A proper remedy for this consists in separating the nitric acid from these interfering substances, for which purpose he suggests shaking out the acid with ether. The substance is mixed with about 10 Cc. of diluted sulphuric acid and the mixture

shaken with about 20 Cc. of ether. After subsidence, 2 or 3 Cc. of the ether are filtered through a dry filter, a small fragment of diphenylamine is added to the ether, and then, carefully, drop by drop, about 5–10 Cc. of concentrated H_2SO_4. In the presence of nitric acid, a dark-blue color is developed. If the ether-filtrate has a yellow color, this may be due to iodine, bromine or chromic acid. Of these, chromic acid alone gives an interfering reaction, producing a dark-blue color likewise. This may be separated, and at the same time the bromine and iodine, by shaking the yellow colored ether with some aqueous sulphurous acid, and then testing the filtered ether as described.—Arch. d. Pharm., *243*, No. 1 (Feb. 27, 1905), 80.

Sodium Nitrate—Determination of Perchlorate.—H. Lemaitre determines the amount of perchlorate in commercial sodium nitrate by the following process, based on the reaction, $NaClO_4 + 4Na_2SO_3 = 4Na_2SO_4 + 4NaCl$. When the nitre contains less than 4 per cent. of perchlorate (as a rule amount is not more than 2 per cent.) 5 Gm. is intimately mixed with 3 Gm. of pure dry sodium sulphite, and heated to tranquil fusion in a platinum crucible. When cool the fused mass is dissolved in water, filtered, and treated with 200 C.c. of 4 per cent. boiling barium nitrate solution. The precipitate is filtered out and washed, to the bulked filtrate and washings 8.2 Cc. $\frac{N}{1}$ NaOH solution, and 1.2 Gm. of sodium peroxide are added, the solution boiled and again filtered. It is then neutralized with acetic acid and titrated with $\frac{N}{10}$ silver nitrate solution in the usual manner. The amount of chlorine present as sodium chloride in the original nitre is meanwhile determined in the usual manner, and the amount found deducted from the above, this giving the chlorine equivalent to the perchlorate. If iodate be present, it can be determined colorimetrically by Auzenat's method. Should more than 4 per cent. of perchlorate be present, the above method is repeated, using twice the amount indicated of reagents.—Pharm. Journ., Oct. 8, 1904, 505; from Moniteur Scientif. [4], *18*.

PHOSPHORUS.

Phosphorus—Cause of Phosphorescence.—E. Jungfleisch's experiments on the phosphorescence of phosphorus lead him to believe—(1) That the vaporization of phosphorus at ordinary temperatures consists of such very minute particles of matter that they would be incapable of giving, by their combustion, luminous phenomena which would be comparable in intensity with phosphorescence; (2) the phosphorus, however, does pass into the surrounding gases, forming in contact with rarefied oxygen, or inert gases slightly impregnated with oxygen, an oxide of phosphorus which is much more volatile than phosphorus itself; (3) the luminous phenomena of phosphorescence result almost exclusively from the spontaneous combustion of the vapor of this phosphorus oxide coming in contact with oxygen;

the variations in intensity depending chiefly on the circumstances under which this contact is effected.—Chem. News, March 17, 1905, 130; from Compt. rend., *140*, No. 7 (Feb. 13, 1905).

Phosphorus—Action on Oil of Turpentine.—The well known antidotal power of oil of turpentine in acute cases of poisoning by phosphorus has been the subject of Schimpff, Koehler and Fort, who attribute the antitoxic action of the oil to the formation of certain substitutive compounds, containing the phosphorus in the form of hypophosphorous acid. Stephan Minovici has now taken up this subject, which has been a matter of controversy, with the object of clearing up the question. He warmed 10 Gm. of phosphorus with 100 Gm. of oil of turpentine (sp. g. 860–870, b. p. 160°) for two hours, in a stoppered flask, frequently shaking. About 3 Gm. of the phosphorus was then dissolved, the decanted solution remaining clear for 24 hours. On passing a current of air through this solution, a white paraffin-like mass, having the odor of garlic, rapidly separated. This mass is not spontaneously combustible when exposed to the air, but may be burned, giving off vapors of a garlicky odor. It melts at 85° C., is insoluble in ether, benzene, water and dilute acids, but soluble in alcohol and chloroform. On exposure to air it quickly becomes yellow and acquires the consistence of a transparent balsam, and in the exsiccator gradually becomes solid, and has the appearance of colophony. The elementary analysis points to the formula $PO_3H._2C_{10}H_{15}$, and it is, therefore, not a substitutive product of hypophosphorous acid, but rather of phosphorous acid. The substance does not exhibit in Mitscherlich's apparatus the well-known reactions of phosphorus. By prolonged heating with caustic potassa solution it is decomposed, and the filtrate gives then the reaction of phosphorous acid.—Apoth. Ztg., *19*, No. 80 (Oct. 5, 1904), 799; from Rev. Farm. Bukarest, through Bull. Soc. roy. de Pharm. de Brus., 1904, 274.

Phosphoric Acid—Determination in Food-Stuffs.—E. Fleurent recommends the following method for the determination of phosphoric acid in food-stuffs: If the substance contains much moisture it is dried and powdered. Ten or 20 Gm. is then weighed off, placed in a 300 Cc. conical flask, and covered with 50 or 100 Cc. of nitric acid, sp. gr. 1.48. The whole is cautiously heated, violent evolution of gas being controlled by rotating the flask when necessary. When action has moderated the liquid is evaporated until only a few Cc. are left in the flask, and then carried to complete dryness in an oven at 110–120° C. The dry residue is treated with 15 to 20 Cc. of a mixture of two parts of strong and one part of fuming sulphuric acid; 1 Gm. of metallic mercury is added, and the organic matter destroyed by heating precisely as in Kjeldahl's nitrogen determination. The cooled acid liquid is then cautiously diluted, neutralized with ammonia, filtered, the filter being washed with a mixture of solution of ammonia 50 Cc., ammonium chloride 20 Gm., water to make 100 Cc. The solution, free from organic matter, thus obtained, is precipitated with

magnesium mixture and the determination conducted in the usual manner. —Pharm. Journ., Mar. 11, 1905, 367; from Bull. Soc. Chim., *33* (1905), 101.

Sodium Phosphate—Correction of Phar. Germ. Test for the Presence of Sulphuric Acid.—To determine the absence of sulphuric acid in sodium phosphate the Phar. Germ. IV, requires that an aqueous solution of the salt (1 : 20), acidulated with nitric acid, shall not become opalescently turbid within 3 minutes after addition of barium nitrate solution. Dr. Aug. Hoffmann has determined experimentally that this test is liable to be misleading because of the failure to prescribe the quantities of nitric acid and of barium nitrate to be employed, and the relations of these to each other and to the solution of the salt. Insufficient nitric acid prevents the retention of the barium phosphate in solution, whereas an excess of barium nitrate solution produces a distinct turbidity within one minute or even immediately in a sample of sodium phosphate solution containing much less than the permissible percentage (3 per cent.) of sulphate. The author's experiments point out that the official definition of sodium phosphate, containing less than 3 per cent. of sulphate, should read as follows:

"Ten Cc. of the solution (1 : 20), treated with 3 Cc. of nitric acid and 5 drops of barium nitrate solution (Pharm. Germ. IV, Rep.) must not become turbid within 3 minutes."—Pharm. Ztg., *49*, No. 56 (July 13, 1904), 589–590.

Basic Calcium Phosphate—Preparation for Ash-Determinations.—E. Gutzeit recommends a method for the determination of ash in vegetable substances (which see under "Materia Medica"), for which pure, freshly calcined basic calcium phosphate is required. This should be prepared by Dammer's method, which is as follows: Chemically pure calcium chloride, pulverized as finely as possible, and finely powdered sodium phosphate, also C. P., are mixed in the quantities necessary to produce the basic calcium phosphate $3CaO.2P_2O_5$ (XOH?), and the mixture is thoroughly calcined. The resulting mass is digested with hot water, thoroughly washed, and yields on drying a flour-like white powder, which may subsequently be calcined as required for the purpose above mentioned.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 474; from Chem. Ztg., 1905, No. 40.

BORON.

Boric Acid—Gravimetric Estimation by Perforation with Ether.—A. Partheil and J. A. Rose describe the following method for the direct gravimetric determination of boric acid which depends on the solubility of the acid in ether and its separation by means of this solvent from its aqueous solution by the process of perforation. The process is particularly applicable to the determination of the acid in milk, meats and other foods, and not much more troublesome than the simple fat determination as ordinarily carried out. The apparatus required for this process is shown by

Fig. 45. It consists in its essentials of the small distilling flask, an exit- and inflow-tube surrounded by a spiral tube for the reception of the boric acid solution to be perforated by the ether, and a condenser. The inflow of liquids into the flask through and from the condenser is possible only through the spiral tube, which, near the top, widens out into a bulb from which the liquid passes into the inflow-tube, and so into the flask. The liquid to be perforated is introduced into the spiral in such quantity that it shall partly fill the bulb, ether in sufficient quantity being then introduced through the condenser, this "perforates" the liquid in the spiral and, separating in the bulb-shaped extremity, overflows into the inflow-tube, and so reaches the flask, charged with the dissolved boric acid. Here it is vaporized, its vapor ascending through the inflow-tube, laterally into the funnel-like expansion of the small tube uniting the spiral and condenser, in which it is condensed, flowing back through to the spiral into the flask, automatically, until the process is ended. The heat is so regulated that the ether shall condense in a thin stream, and is usually continued during 18 hours, when the flask is changed by a second one and the perforation continued two hours longer, or until the ether no longer carries over any boric acid, the process is ended. The previously tared flask, containing the ethereal solution of boric acid, is then placed under a bell-exsiccator over sulphuric acid, and containing also a dish of freshly-burnt lime, and, the ether being drawn off in a vacuum of 12–15 Mm., the residual boric acid is dried to constant weight. The authors give specific directions for manipulating according to the material in which the boric acid is to be determined. The solution to be perforated must not contain either sulphuric, phosphoric or nitric acid, nor appreciable quantities of iron. The method has been used with good results for the determination in a large variety of minerals, which are enumerated, and special directions are given for its determination in milk, chopped meats and margarines.—Arch. d. Pharm., *242*, Nos. 6 and 7 (Aug. 11 and Oct. 11, 1904), 478–488.

Fig. 45.

Boric Acid—Natural Occurrence and Determination in Cider, Fruits, Etc.—Alfred H. Allen and Arnold R. Tankard, after referring to the natural occurrence of traces of boric acid in certain plants, trees, fruits, etc. (and to the authorities on this subject in a foot-note), confirm the presence of this acid in wine, cider and allied products, and, furthermore, in apples, pears, quinces, grapes and pomegranates. The presence of this acid was proved by drying the fruit or evaporating the liquid, then incinerating and treating the ash with excess of dilute hydrochloric acid. On partially immersing a piece of turmeric paper in the acid solution and drying, the

paper acquires a brownish-red color where the acid has acted on it. The authors also describe the following process for the estimation of boric acid, which they prefer, this being an adaptation of the well-known glycerin reaction: A known weight of substance is treated with solution of calcium chloride, evaporated, and charred. The ash is treated with water, and the clear solution evaporated to 25 or 30 Cc. This is neutralized with decinormal acid, methyl-orange being used as an indicator, then an equal volume of glycerin is added; this liberates boric acid, which is now titrated with twentieth-normal sodium hydroxide solution and phenolphthalein. A table showing the percentages of boric acid naturally contained in various fruits, etc., concludes this very interesting paper.—Tran. Brit. Pharm. Conf. (Year-book of Pharm.), 1904, 483–489.

Boric Acid.—Use of the Yellow Coloring Matter of *Mimosa flowers* (which see under "Materia Medica") for its detection.

Sodium Tri-Borate—An Abnormal Form of Borax.—L. Spiegel, having occasion to prepare some $\frac{N}{5}$ solution from refined borax, which had for this purpose been heated in a platinum crucible for the complete elimination of water of crystallization, found that the borax solution required only one and one-half times its volume of $\frac{N}{10}$ sulphuric acid for saturation instead of the expected two volumes. Investigation proved this deviation to be due to the fact that the original refined borax was in reality a crystalline triborate instead of biborate, a hitherto unknown compound, the existence of which had escaped notice because of the fact that in contact with water under ordinary conditions the triborate splits up into biborate and tetraborate. Under certain conditions, however, not nearer described, the triborate may crystallize out from solutions of biborate containing boric acid in excess, but these conditions are rarely attained.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 770; from Chem. Ztg., 1904, No. 64.

Sodium Perborate—A New Antiseptic Compound.—Etard having shown that by the action of boric acid on hydrated barium peroxide a compound of the formula $BaB_2O_5,3H_2O$ is produced, Jaubert investigated the reaction of the acid upon sodium peroxide under the same conditions, but obtained compounds of a different character. When a mixture of 248 Gm. of boric acid and 78 Gm. sodium peroxide is gradually added to 2 liters of cold water with constant agitation, a solution is at first obtained, but crystals quickly separate; these crystals, when dried below 50° C., contain 4.17 per cent. of active oxygen, and their composition is probably $Na_2B_4O_8,10H_2O$. On simply dissolving in water, without the addition of acids, hydrogen peroxide is produced, the solution being alkaline in reaction. The author has named this sodium perborate.

Perborax. It is soluble to the amount of 42 Gm. in 1 liter of water at 11°, 71 Gm. at 22°, and 138 Gm. at 32° C.; solutions prepared at the ordi-

nary temperature are fairly stable. By recrystallizing the perborax, compounds richer in active oxygen are obtained, until ultimately a compound results which contains more than 10 per cent. of active oxygen. The same result can be attained more quickly by half saturating the sodium in the perborax by means of a mineral acid, when a compound $NaBO_3$, $4H_2O$ separates; this is very stable, and undergoes no change through the carbon dioxide in the air. It is less soluble in water than perborax and for this product the author proposes the name

Perborate. At 50° to 60° C. it dissolves with fair celerity, but with production of some oxygen, whilst at 100° C. the oxygen is liberated very rapidly; a cold aqueous solution possesses all the properties of a hydrogen peroxide solution. Since the dry salt is extremely stable, it forms a convenient means for the rapid preparation of hydrogen peroxide solution; through the action of 50 per cent. sulphuric acid on the powdered perborate a hydrogen peroxide of 150 to 200 volumes can be prepared; but great caution must be exercised in using such a strong solution, since it may act injuriously on the skin. Albert Robin regards this perborate to be of great use in surgery, where one is in the position to rapidly prepare 8 to 10 liters of 10 to 12 volumes hydrogen peroxide. In order to prepare hydrogen peroxide solution, it is only necessary to dissolve the salt in water at the ordinary temperature; 25 Gm. in 1 liter of water forms a solution of 2 volumes strength; with water at 20° to 35° C. a 4 to 5 volumes solution is obtained. If stronger solutions are required, the addition of acid is necessary; to prepare a 10 to 12 volumes solution the following formula may be used: Perborate, 170; citric acid, 60; water, 1,000; and, for a 18 to 20 volume solution, perborate, 210; citric acid, 105; water, 700.—Apoth. Ztg., *20*, No. 8 (Jan. 28, 1905), 66; from L'Union Pharm., 1905, No. 1.

Sodium Hyperborate—Antiseptic Value.—According to Kischensky, sodium hyperborate, $NaBO_3.4H_2O$, a salt of perboric acid, eliminates hydrogen dioxide from its aqueous solutions, and has proven an efficient antiseptic for wounds, etc. It may be applied either as dusting-powder or in form of freshly prepared solution. It has been found useful also when administered internally as an intestinal antiseptic.—Pharm. Ztg., *50*, No. 29 (April 12, 1905), 308; from D. Med. Wschr., 1905, No. 11.

SILICON.

Fused Silica—Permeability by Gases.—Mr. P. E. Berthelot finds that vessels made of fused silica are found to be distinctly permeable by gases. Under some conditions a notable exosmotic or endosmotic action may be observed, comparable to that which occurs with an animal membrane. The rate at which this takes place depends on the thickness of the siliceous layer, on its degree of softening under heat, on the temperature, and other conditions. When pure carbon is heated in a vacuous-sealed silica tube to 1,300°–1,325° C. for half an hour a small amount of gas is formed, which,

on analysis, is found to be three-fifths nitrogen and two-fifths carbon monoxide. This shows that atmospheric air has traversed the walls of the tube during the heating, and the oxygen has combined with the carbon. When similar tubes containing hydrogen are heated, no less than 44 per cent. by volume of the gas is found to disappear, either by transpiration or by combination with oxygen. Similar transpiration of hydrogen is observed when solid hydrocarbons were heated, *in vacuo*, in silica tubes.—Pharm. Journ., May 20, 1905, 721; from Compt. rend., *140* (1905), 82.

Kieselguhr—Occurrence on the Lüneburg Heath, Uses, &c.—The "Deutches Tageblatt" gives an interesting account of an important industry of the Lüneburg Heath consisting in the mining of the diatomaceous earth, known in the vernacular as kieselguhr (literally flint ferment) and bergmehl (or mountain meal), which is found in deposits of vast dimensions on the heath mentioned. The material consists of the flinty skeletons of infusoria (*diatomaceæ*), and its value rests on the structure of the individual skeletons. Under the microscope one may see these little bells, tubes, ladders, wheels, etc., and differentiate one from another, and the stuff, as mined, is the more valuable, as it consists more completely of these organisms. A kieselguhr which, under the microscope, shows but few of these organized forms and consists mainly of indistinguishable points, is impure and of little value. A kieselguhr consisting of nothing but diatoms, has not yet been found anywhere in Germany, except on the Lüneburg Heath, and while vast deposits of the material have been found in other countries, up to the present none have been discovered as pure and fine as those of the Lüneburg Heath. In fact, it may be asserted with truth, that here we have the only genuine deposit in existence.* The material is obtained by mining, partly by hand and partly by machine work. The material consists of light slaty rocks, which are torn loose, with little display of energy, by a pick, and are found at a depth of from 100 to 150 feet. The principal useful properties of kieselguhr, outside of its value as an insulator, are its high powers of absorption, its light specific gravity (0.200 to 0.400), its resistance to the action of fire, acids, etc., and its high content of pure silicic acid (from 85 per cent. to 96 per cent.). On the basis of one or several of these qualities, kieselguhr finds employment in the manufacture of dynamite, in the aniline and ultramarine industries, as an enveloping or filling medium for gum, sealing-wax, papiermaché, fine toilet soaps, the lighting cap of matches, as packing medium for liquids of all descriptions (like mucous sugar juices, oils, liqueurs, fruit juices, etc.). Beside these, it is used in the preparation of pastes, ointments, disinfecting pow-

* The editor of the National Druggist has the following to say in reference to this. "We have seen and examined specimens of deposits, one from Missouri and one from Kansas, that were so nearly absolutely free from extraneous matter that they might with justice be termed pure. We have at present no means of telling the extent of these deposits, but both are said to be large and one has been declared "unlimited."

ders, polishing powders and other pharmaceutical preparations.—Nat. Drugg., May, 1905, 148.

Kieselguhr—Technical Uses.—According to "Chemiker Zeitung," kieselguhr is converted by a patented process, into solid stone-like masses named "Guhrolit," which are characterized by great lightness, resistance to fire and the action of water and most chemicals, and are readily sawed, nailed, bored, etc. It is also proposed to form it into plates, with and without intervening spaces, as well as into filtering plates for filtering oils and all sorts of turbid fluids.—Pharm. Ztg., *49*, No. 53 (July 2, 1904), 536.

Pumice—Utility of the Powder in Incineration.—Duyck strongly recommends the admixture of coarsely powdered pumice stone as a means of facilitating the ashing of organic matter. The solid substance, or the evaporation residue, is mixed with an equal weight of the recently calcined pumice, then ashed in the usual manner. In this manner, the most refractory substances—such as albumin, wool, etc.—are easily reduced to ash. The method is preferable to the use of ammonium nitrate or nitric acid, since it does not cause profound change in the chemical composition of the ash.—Pharm. Journ., Oct. 22, 1904, 583; from Annales de Chim. analytique, *9*, 254.

CARBON.

Filamentous Carbon—A New Variety.—C. Constant and Henri Pélabon call attention to a new form of carbon, which is produced during the formation of coke in an open furnace in that portion exposed to a very high temperature, being most frequently met with when material very rich in tar is operated on. The deposit consists of a woolly substance with grey and black threads. The grey filaments are generally cylindrical, and appear to be formed of a series of superimposed cones, covered with a kind of glaze similar to that formed on the particles of adjacent coke. There is no indication of crystalline structure. The black filaments are dull, and their surface is rough, the asperities being sometimes very regularly arranged, so that the threads appear to be formed of a succession of rings, six of which have been counted in a length of 0.1 Mm. The threads are generally from 0.03 to 0.15 Mm. thick, but the black filaments are thinner, not exceeding 0.002 Mm. in diameter. In length they vary from 0.05 to 0.08 Mm. This carbon wool does not commence to form carbonic anhydride, when heated in a current of oxygen, until the temperature approaches 585° C., at which slow but complete combustion occurs. After twelve hours' immersion in a mixture of nitric acid and potassium chlorate the wool is converted into a yellowish substance, although the form of the filaments remains unaltered. It consists of graphitic oxide, and ignites, with sparking, when heated to about 300° C.—Pharm. Journ., Jan. 7, 1905, 13; from Compt. rend., *137*, 706.

Carbon—Determination by Oxidation with Chromic Acid.—G. T. Morgan prefers the substitution of phosphoric acid for sulphuric or hydrochloric acid in the gravimetric determination of carbon dioxide in native carbonates. When these substances contain organic matter, chromic acid is subsequently added to the contents of the distilling flask and the operation repeated, the second increase in weight of the tared absorption tube being due to the oxidation of the organic carbon. The mixture of chromic and phosphoric acids is also used in determining the total carbon in cast-iron and ferromanganese, the employment of a non-volatile acid instead of sulphuric acid obviating the risk of carrying over acid fumes into the weighed absorption tube.—Pharm. Journ., July 9, 1904, 42; from Proc. Chem. Soc., *20*, 167.

Carbon Dioxide—Value as a Remedy for Mountain Sickness.—A. Mosso records the results of a series of observations on the effect of carbon dioxide as a remedy for mountain sickness, the experiments being performed both on human beings and on monkeys, and the results quite conclusive. From these it is recommended that about 8 per cent. of carbon dioxide should be added to the compressed oxygen carried for use in high balloon ascents, as pure oxygen is not in itself sufficient to remedy the effects of great barometric depressions.—Pharm. Journ., June 3, 1905, 821; from Atti dei Lincei, *14* (1), 6, through "Nature."

Carbon Bisulphide—Spontaneous Inflammation.—C. Pappe calls attention to the spontaneous inflammation of carbon bisulphide, which was being transferred from a glass bottle through a metal funnel into a large glass balloon (carboy) by a workman, in an open field, and about 100 M. distant from a fire-place. The inflammation occurred almost immediately after beginning to pour out the carbon bisulphide, and is ascribed by the author as being due to electric friction caused by the metallic funnel. It is, therefore, recommended that in the transfer of carbon disulphide from one glass vessel into another, this should be done by the interposition of glass funnels, and that the use of metal funnels be avoided. The spontaneous inflammation of benzin, ether, and of other inflammable fluids, has heretofore been occasionally noted, and like precautions should be observed in the transfer of these also.—Pharm. Ztg., *50*, No. 4 (Jan. 14, 1905), 40; from Chem. Ztg., 1904, No. 99.

CYANOGEN COMPOUNDS.

Barium Platino-Cyanide—Preparation.—According to A. Brochet and J. Petit, the usual tedious preparation of barium platino-cyanide, a salt used for X-ray screens, can be simplified by making use of the fact that platinum is soluble in barium cyanide under the influence of an alternating current. With a current of 0.4 ampère per square Cm., a P.D. of five volts, and an electrolyte containing 270 Gm. of barium cyanide per liter, a satisfactory product is obtained. The product obtained by crystallization

does not at first possess the fluorescence necessary for use for X-ray screens, but by recrystallization from a solution containing cyanide—*e. g.*, barium cyanide—the small fluorescent crystals are readily obtained.—Pharm. Journ., April 1, 1905, 484 ; from Zeit. Electrochem. *10* (1904), 922.

Mercuric Oxycyanide—Commercial Confusion with Mercuric Cyanide.—Richard finds that the so-called oxy-cyanide of mercury met with in Continental pharmacy is almost invariably mercuric cyanide, $Hg(CN)_2$, and not the oxysalt. The effects attributed to the oxycyanide, in published therapeutic reports, must therefore be attributed to the cyanide. True oxycyanide of mercury, $Hg(CN)_2HgO$, is much less soluble in water at ordinary temperatures than the cyanide, 1.1 : 100, compared with 5.5 : 100. In alcohol (90 per cent.) it is only soluble to the extent of 1 : 110, whereas the cyanide dissolves to the extent of 1 : 5. The oxycyanide is thus prepared :—Mercuric cyanide, 10, is boiled under a reflux condenser, with yellow mercuric oxide, 7, and water, 200, for three hours, and filtered while hot. On cooling the filtrate deposits a white microcrystalline precipitate, which, when washed on a suction filter with 100 parts of water, and dried *in vacuo* over sulphuric acid, or for fifteen hours in a drying closet at 40–45°, has a composition approximately that of $Hg(CN)_2HgO$. The oxycyanide is not very stable ; at temperatures above 80° C. it becomes dark colored and shining, probably due to the liberation of metallic mercury or of suboxide. Caustic potash and soda do not color the oxycyanide ; strong ammonia, which readily dissolves the cyanide, leaves an insoluble residue of mercuric oxide with the oxycyanide.—Pharm. Journ., Dec. 3, 1904, 815 ; from Journ. Pharm. Chim. [6], *18*, 553.

ALKALIES.

Alkaline Carbonates—Dissociation in Vacuo.—Having shown that lithium carbonate may be completely volatilized below 1000° C. *in vacuo*, P. Lebeau has now directed his attention to the other alkaline carbonates under like conditions, and finds that they also may be similarly first dissociated, then the oxide formed volatilized, *in vacuo*, below 1000° C. The carbonates of sodium, potassium, cæsium, and rubidium were all volatilized between 800–1000° C. Lithium and sodium are more readily dissociated than the other three alkalies, but the facility of dissociation appears to be greater with lithium, which has a lower atomic weight, than with sodium, With potassium, rubidium, and cæsium, the reverse appears to be the case, the element with the highest atomic weight, cæsium, being the most easily dissociated.—Pharm. Journ., Dec. 3, 1904, 814 ; from Comptes. rend., *137*. 1,255.

Potassium Hydrate—Preparation of Colorless Alcoholic Solutions.—M. Kitt finds that the yellow color of alcoholic solutions of KHO is due to the presence of aldehyde in the alcohol, and secures colorless solutions, such as are required for the analyses of fats, by redistilling the alcohol and

rejecting the first portions of distillate, which contain all of the aldehyde. The solutions so obtained retain their colorless condition unimpaired by age, and are regarded as being superior to those obtained with alcohol, which, as recommended by Waller, is rectified after treatment with potassium permanganate to distinct coloration.— Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 770; from Chem. Rev. Fett. u. Harz. Ind., *11*, 173.

Potassium Hydrate—Preparation of a Permanently Colorless Alcoholic Solution.—Thiele and Marc recommend the following process for preparing an alcoholic solution of potassium hydrate which does not become brown on standing: calculated to make one liter of $\frac{N}{10}$ solution, 43.5 Gm. of the *purest* potassium sulphate and 110–120 Gm. of pure barium hydrate are well mixed in a tared platinum or porcelain dish, and heated for 10–15 minutes, constantly stirring, with 100 Cc. of water. After cooling, the evaporated water is restored, and the mixture is transfered to a glass flask with the aid of 800 Cc. of Alcohol and, finally 100 Cc. of water. The closed flask and contents is then shaken thoroughly. After subsidence, from 3 to 4 Cc. of a concentrated solution of potassium sulphate is added, to precipitate the little barium hydrate remaining in solution, and after again shaking and subsidence, a portion of the clear liquid having been tested with sulphuric acid for the complete absence of barium, the clear solution is syphoned into suitable containers.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1904), 1041; from Ztschr. f. öff. Chem., 1904, No. 20.

Sodium Bicarbonate—Preparation for Standardizing Acid Solutions.—The usual method of standardizing an acid solution is to use sodium carbonate, prepared by igniting the bicarbonate. As it is troublesome, if not impossible, to prepare pure dry normal carbonate, B. North and W. Blakey have devised a method for obtaining the perfectly pure and dry bicarbonate. About 400 Gm. of sodium bicarbonate is washed in a large funnel with distilled water, using a filter pump, until the salt is found to be quite pure except for the presence of the normal carbonate. The bicarbonate is air-dried on porous plates, powdered, and placed in a moist atmosphere of CO_2 for several hours, until it gives no reaction to phenolphthalein. The salt is afterwards desiccated, and remains perfectly stable and pure for any length of time in a closely-stoppered bottle. Sodium bicarbonate thus prepared is said to be eminently suitable for analytical work.—Pharm. Journ., May 20, 1905, 121; from Journ. Soc. Chem. Ind., *24* (April 29, 1905), 395.

Ammonia—Direct Synthesis.—In a previous research it was shown by Edgar Philip Perman that ammonia is decomposed almost (if not quite) completely when heated in a porcelain vessel at about 800° to 1100° C., and that there is no sign of equilibrium between the ammonia and its decomposition products at any of the temperatures employed, 677°–to 1111° C. In order to discover if there is any such state of equilibrium, it was thought

better to attempt to reach that state by synthesizing ammonia instead of decomposing it, as the testing for and estimation of the ammonia could then be carried out with much greater accuracy. The results of these investigations are summarized by the author as follows:

1. So far as can be shown by one of the most delicate tests known to chemists, ammonia cannot be synthesized by heat (except under special conditions specified below). The decomposition of ammonia by heat may therefore be regarded as an irreversible reaction.

2. Ammonia may be synthesized in small quantities from its constituent elements (*a*) by heating with many of the metals; (*b*) by exploding with oxygen; (*c*) by sparking. These are reversible reactions.

3. It would appear that the synthesis of ammonia is effected only when the gases are ionized; the ionization would be brought about by sparking, or by the high temperature of an explosion of hydrogen and oxygen. The immediate decomposition of the ammonia formed would be prevented by its sudden cooling. The metals in the presence of moisture also produce "nascent" or ionized hydrogen.

4. It does not appear that nitrides of the metals form an intermediate stage in the formation of ammonia, for it was found that metals readily forming nitrides, *e. g.*, magnesium, did not produce more ammonia than the others.

5. There is a close analogy between ozone and ammonia with regard to their synthesis and decomposition; both are formed by sparking, and both are completely decomposed by heat.—Chem. News, June 23, 1905, 283–285.

Ammonia and Amides—Quantitative Determination.—In studying the reaction of ammonia and amides with hypochlorites, J. Effront came to the following conclusions:—1. An alkaline solution of hypochlorite can be kept in absence of air in daylight for about thirty hours without losing chlorine. 2. The amides, imides, nitril bases, acid amides, and amido acids react at ordinary temperatures on hypochlorite, a loss of bleaching chlorine taking place; this loss is in direct proportion to the weight of the organic substance used. 3. The ammonium bases at the ordinary temperature give no reaction with hypochlorite. The fact that the quantity of chlorine set free is in direct proportion to the weight of the substance used, can be used to determine the above nitrogen compounds by means of a solution of arsenous acid. Twenty Cc. of a solution of bleaching powder (containing 1.5 to 2 per cent of chlorine), 20 Cc. of normal sodium hydroxide solution, and 1 to 5 Cc. of a 1 per cent solution of the substance to be examined, are introduced into a flask which is filled with distilled water, closed, and kept in the dark for twelve to fifteen hours. For the chlorine determination a solution of arsenous acid is used, the excess of the acid being titrated back by means of an iodine solution. Thus from the quantities of chlorine found the reduction value of the substance used is ob-

tained. This method of determining ammonia is especially suited for water analysis. The reaction proceeds according to the following equation:—$2NH_3+3CaOCl_2=3CaCl_2+3H_2O+2N$, the chlorine per Gm. of ammonia being found = 6.55, and calculated = 6.258. In determining the ammonia in water the protein substances must be taken into account, as they possess a very high reduction value, which is constant for different protein substances, and may be used for their quantitative determination. The decomposition products of the protein substances have a lower reduction value than the natural albuminous substances. The effect of protein substances on the hypochlorite solution is only very slow, and the chlorine must not be determined within fourteen or sixteen hours from the beginning of the experiment.—Chem. News, Jan. 6, 1905, 10; from Berichte, 37 (1904), No. 16.

Ammonium Salts—Hydrolytic Change in Aqueous Solution.—Dr. Hugo Bauer calls attention to the changes which ammonium salts are liable to undergo in aqueous solutions, due to the feeble basicity of the ammonia and its gradual elimination by hydrolytic action. This quickly renders the solution of a neutral ammonium salt, such as the chloride or bromide, acid in its reaction, and the pharmacopœial (G. P.) requirement of neutrality is therefore not justified either theoretically nor, as developed in the author's experiments, in practice.—Pharm. Ztg., *50*, No. 13 (Febr. 15, 1905), 133.

Ammonium Carbonate—Variation in Quality, Etc.—William Johnston has collected and ascertained the strength of twenty-five samples of ammonium carbonate in retail chemists' and oilmen's shops, with the results shown in the following table:

Condition of Specimen.	Number of Samples about same Strength.	Number of Cc. of Vol. H_2SO_4 = to 1 Gm.
Uneffloresced pieces	2	18.5
Hard pieces, superficially effloresced (representative portions)	9	17 to 18
Roughly crushed; taken from stoppered bottle	1	17.6
Representative portions of dull lumps	7	16 to 17
Bright lump without efflorescence	1	16.6
Whitish pieces, partly effloresced	2	15 to 16
Whitish pieces, partly effloresced	2	14 to 15
Lump, effloresced nearly to centre	1	13.3

Only two specimens came nearly up to the B. P. requirement (18.7 Cc.

of volumetric sulphuric acid for 1 Gm.), the average acid equivalent being 16.7 Cc. The best samples were obtained from shops where the carbonate was kept in the well-bunged jars in which the wholesalers send it out. A practical side to the author's inquiry, leaving out of consideration the loss in weight occasioned by the gradual conversion of the carbonate into bicarbonate, consisted in determining by actual experiment the relative efficiency of the average ammonium carbonate, having a neutralizing power of 16.7 Cc. and of the completely effloresced bicarbonate, having a neutralizing power as low as 12.5 Cc. Flour mixed with the same weights of these two kinds were submitted to a baker, who prepared sponge cakes from the two sorts under precisely identical conditions. The cakes prepared with the flour containing the effloresced carbonate (*i. e.*, the bicarbonate) were found to be light and spongy, and those made with the strong ammonia were heavy and solid. These differences have heretofore not been recorded in works of reference, although they have frequently been suggested.—Chem. & Drugg., July 30, 1904, 161.

Cæsium Amide—Preparation and Characters.—According to E. Rengade, cæsium amide is best prepared by heating metallic cæsium to about 120° C. in a current of dry ammonia gas, when reaction takes place according to the equation $Cs + NH_3 = CsNH_2 + H$. The product is a white solid, readily soluble in liquid ammonia, from which it crystallizes in small prisms or lamellæ, melting, *in vacuo*, at 260° C. It has a great affinity for oxygen, becoming yellow on exposure to the air, and evolving ammonia. When oxygen is passed into a solution of the amide in liquid ammonia at —60° C., the compound is completely oxidized, cæsium nitrite and hydroxide being formed, and ammonia liberated. Carbonic anhydride has no action on cæsium amide, but water causes its violent decom position; if the reaction takes place in the air deflagration occurs. The same amide is formed, but very slowly, by the spontaneous decomposition of cæsium ammonia.—Pharm. Journ., May 27, 1905, 789; from Compt. rend., *140* (1905), 1183.

ALKALINE EARTHS.

Alkaline Earths—Volumetric Estimation.—E. Rupp and A. Bergdolt describe a method for the volumetric estimation of the alkaline earths which is based upon the sparing solubility of the oxalates of calcium, strontium and barium obtained by the reaction of their soluble salts with ammonium oxalate in excess, and titration of the excess of oxalate employed by means of permanganate solution. The authors employ an approximately saturated solution of crystallized ammonium oxalate (about 3.5 per cent.) as precipitant and a solution of potassium permanganate containing about 3.2 per cent., the titre of the two solutions being accurately determined, that of the permanganate preferably by the method of Volhard. In place of ammonium oxalate, normal solution of oxalic acid

—which has about double the value of the former—may also be used, the titre being established in either case for oxalic acid. The method is exemplified by the following

Determination of Calcium.—A suitable quantity about 10–20 Cc. of solution of a calcium salt is placed in a flask of 100–250 Cc. capacity with 1–2 Gm. ammonium chloride and heated on a wire-net to boiling; ammonia is added in slight excess, followed by the gradual addition of a known volume of the solution of ammonium oxalate or of oxalic acid—the heating being continued for several minutes after all has been added. The flask with contents is then placed in cold water and when cooled brought to a specific volume and filtered. Rejecting the first few cubic centimeters that pass through the filter, the excess of oxalate (or oxalic acid) is determined in 50–100 Cc. of the filtrate by diluting it with 150–200 Cc. of hot water, adding about 10 Cc. of diluted sulphuric acid and 2–3 Gm. manganous sulphate, and then titrating with the solution of permanganate. The calculation is then made on the basis of 1 Cc. $\frac{N}{10}$ $KMnO_4$= 0.002 Gm. Ca. For the details of the method as applied to the other alkaline earths, individually and collectively, the original paper may be consulted in Arch d. Ph., *242*, No. 6 (Aug. 11, 1904), 450.

Metallic Calcium—Properties.—K. Arndt found the specific gravity of a specimen of metallic calcium obtained from the electro-chemical works at Bitterfield to be 1.54, rising to 1.56 after the metal had been fused, while a specimen prepared by the author himself gave 1.59. This difference was to be ascribed to the higher percentage of silicon in the latter (1.1 per cent as compared with 0.6 per cent Si). Another specimen, containing 0.5 per cent Si, had the specific gravity 1.577. Thus it appeared from these results that the specific gravity of pure calcium must be less than 1.54, and for distilled calcium it was found (by the method of suspension in a mixture of chloroform and ethyl iodide) to be 1.52. The melting-point *in vacuo* appears to be about 800° C., and below this point it begins to pass into vapor, and is deposited in fine crystals. The vapor reacts very readily with air, giving CaO and Ca_3N_2. Solid calcium reacts similarly, but far more slowly.—Chem. News, Febr. 3, 1905, 49; from Berichte, 37 (1904), No. 18.

Calcium—Physical Constant of the Metal and its Amalgam.—H. Moissan and M. Chavanne find the electrical conductivity of calcium to be 15.6 at 10° C., compared with silver 100. The fusing-point is 810° C., but at 790° to 795° the calcium passes into a pasty state. The density of calcium they find lying between 1.525 and 1.560. They have also investigated the properties of the crystalline calcium amalgam; this is stable in dry air, and absorbs neither nitrogen nor oxygen. In damp air, on the contrary, it is rapidly affected, and becomes transformed into a mixture of lime and finely-divided mercury. It acts chemically as a strong reducing agent.—

Chem. News, Feb. 17, 1905, 83; from Compt. rend., *140* No. 3. (Jan. 16, 1905).

Metallic Calcium—Commercial Production and Uses.—According to A. Senier and R. Clarke, metallic calcium may now be obtained commercially in the form of sticks. It is white in color, and of the hardness of brass, being easily turned in a lathe. The turnings are a convenient form to use. Its employment in place of sodium for the experimental production of hydrogen is recommended, as the reaction is more moderate and the solid calcium hydroxide produced can be observed. It may also be used for making the oxide, chloride, sulphide, and phosphide by direct combination of the elements, the gases or vapors being led over the warmed metal and combining with brilliant incandescence.—Chem. News, *91* (1905), 87.

Metallic Calcium—Applicability to a Variety of Uses.—With the object of testing the applicability of metallic calcium for different purposes, Ernst Beckmann has made a number of experiments which are briefly described as follows: Before use, the calcium as obtained from the makers, should be turned on a lathe; the turnings maintain their metallic lustre if kept in a dry atmosphere. Nitrobenzene dissolved in 95 per cent. alcohol containing a few drops of mercury chloride or copper sulphate solution, and heated with a slight excess over the calculated amount of calcium give an almost quantitative yield of azoxybenzene. In presence of hydrochloric acid the substance was reduced to aniline. Oximes were reduced to amines both in alkaline and in acid solution; benzene chlorosulphonic acid was reduced in acid solution to the corresponding sulphinic acid, whereas in acid solution it yielded thiophenol. Calcium is also able to replace magnesium in Grignard's reaction. Iodobenzene, dissolved in anhydrous ether, heated with finely divided calcium and a trace of iodine, reacts after about an hour to give a brown powder which is fairly soluble in ether. The solution, on treatment with carbon dioxide, gives benzoic acid. Ethyl iodide reacts after ten minutes' heating with calcium to give a white amorphous mass of ethyl calcium iodide, which is only slightly soluble in ether. Alkyl halogens do not react with calcium in benzene solution. Finally, metallic calcium has been successfully employed in the reduction of the oxides of manganese and lead, and the oxide and sulphide of copper to the corsponding metals, according to Goldschmidt's method.—Pharm. Journ., May 20, 1905, 721; from Berichte, *38* (1905), 904.

Calcium Salts—Quick and Reliable Method of Determination.—F. H. Alcock briefly reviews the usual methods of the determination of calcium in its salts, and recommends the following quick, safe, and easy method, which simply requires careful manipulation: After obtaining the carbonate by the usual method, convert it into the nitrate, evaporate the solution to dryness; then heat gently, being careful, as fusion begins and continues to avoid spurting, and strongly ignite finally for a few minutes. The end of

the action is readily observed by the state of the mass in the platinum dish, and by the cessation of evolution of ruddy fumes. To prove 0.240 Gm. of calc. spar was converted into the nitrate by diluted nitric acid, evaporated to dryness, ignition, and finally weighing, when 0.134 Gm. was obtained. The nitric acid must be examined for solid residue, because it frequently contains iron.—Pharm. Journ., Oct. 15, 1904, 544.

Barium Chloride—Volumetric Determination.—After reviewing the different volumetric methods for determining barium chloride in solutions, F. H. Alcock recommends the following as being short, simple and accurate when compared with the gravimetric process of precipitation, collection, and ignition as barium sulphate: A slight excess of pure sodium sulphate is added to the solution of barium chloride, and the resulting sodium chloride is titrated with standard solution of silver nitrate, using neutral potassium chromate as the indicator. As the precipitated barium sulphate does not interfere with the action, it need not be removed by filtration. Obviously this method is applicable to solutions that are known to be free from other chlorides.—Pharm. Journ., Aug. 6, 1904, 173.

Strontium, Barium and Calcium—Detection and Distinction by a Michrochemical Method.—W. Autenrieth finds that when potassium chromate is added to a strontium salt in neutral solution, strontium chromate is precipitated in crystalline form; a barium salt treated in the same way gives an amorphous precipitate. Strontium chromate, which is found to be readily soluble in acetic acid but only sparingly in boiling water, is dimorphic; when one drop of a 0.28 normal strontium nitrate solution is treated with one drop of a 10 per cent. solution of potassium chromate on a microscope slide, slender, highly refractive needles of strontium chromate are thrown out; from very dilute solutions, this substance separates on prolonged standing in short, stout, hexagonal prisms or dumb-bell shaped crystals. The hexagonal prisms would appear to be a labile form, for on keeping they gradually change into needles. The author recommends the following procedure for the detection of barium, strontium and calcium in the presence of each other. The dried mixed chlorides should be thoroughly triturated with absolute alcohol to dissolve the calcium and strontium salts and the undissolved portion tested for barium in the ordinary way. The alcoholic extract, after evaporating to dryness on the water-bath, is dissolved in 1 or 2 Cc. of water, and filtered if necessary. One drop of this solution should be treated with one drop of potassium chromate and examined under the microscope; long, yellow needles indicate strontium; the addition of a few drops of dilute acetic acid to the mixture will cause the crystals to dissolve, leaving, possibly, an amorphous precipitate of barium chromate. To test for calcium the remainder of the mixed chlorides of strontium and calcium is evaporated to dryness with strong nitric acid, and extracted with absolute alcohol, in which strontium nitrate

is insoluble.—Pharm. Journ., Dec. 17, 1904, 900; from Berichte, *37* (1904), 3882–3887.

Strontium—Micro-Chemical Detection in Chromate.—On subjecting the salts of the metals of the alkaline earths to a micro-chemical examination, W. Autenreith has found that strontium chromate, when precipitated in neutral aqueous solution, very readily forms crystals. Barium chromate similarly prepared is amorphous or indistinctly crystalline, while calcium chromate is soluble in water. If 1 drop of a 10 per cent. solution of potassium chromate is added to a 3 per cent. solution of strontium nitrate, and the resulting crystals magnified 120 times, long, yellow crystalline needles are seen, of length 100–200 μ and width 1 μ; these collect together in clusters, and are very characteristic of strontium chromate. If the strontium solution is much weaker the crystals only separate out on standing for some time, and are then short, thick, hexagonal prisms. The author has not succeeded in getting spherical crystals as described by Behrens. The short, thick crystals are also produced when a fairly dilute solution of strontium chromate in acetic acid or a mineral acid is allowed to stand for some hours after addition of excess of ammonia. Such a preparation on being kept for three months appeared to contain almost exclusively the crystals in the form of long needles. Thus strontium chromate possesses two crystalline modifications. The form which crystallizes in thick prisms is probably the labile form, which appears to pass gradually into the stabile modification, crystallizing in long needles. Strontium chromate when moist is easily soluble in acetic acid; when thoroughly dried at 120° C., it is very slowly but completely dissolved. It is difficultly soluble even in boiling water. The easiest method of detecting barium, strontium and calcium in presence of one another is to grind up the dry powdered chlorides repeatedly with absolute alcohol, and filter. Barium may then be detected in the insoluble portion by flame, coloration, etc. The alcoholic filtrate is evaporated to dryness on the water-bath, the residue taken up with water, and filtered if necessary. Then a drop of potassium chromate is added to a drop of this solution and examined under the microscope; the formation of characteristic long needles shows the presence of strontium. Calcium may be detected either spectroscopically or by means of the flame reaction, after evaporating the rest of the chloride solution with strong nitric acid, and separating the two nitrates by means of absolute alcohol.—Chem. News, Dec. 16, 1904, 305; from Berichte, *37* (1904), No. 15.

Strontium Amide—Preparation.—According to Roederer strontium ammonium, $Sr6(NH_3)$, is obtained by passing dry gaseous ammonia over pure metallic strontium cooled to—60° C. The metal is immediately covered with a reddish-brown efflorescence, which dissolves in the excess of ammonia, forming a deep blue liquid. On removing the ammonia, *in vacuo*, strontium ammonium is deposited in dark-red crystals.—Pharm. Journ., June 3, 1903, 821; from Compt. rend., *140* (1905), 1253.

Magnesium—Bactericidal Action of the Metal and Its Oxide.—F. Dienert observes that when metallic magnesium is placed in contact with pure centrifugated *Bacillus coli communis*, or Erberth's bacillus, and water, it is found that in three days all the bacteria are killed. If instead of the pure metal, magnesia be employed, they are not destroyed, but their reproductive powers are diminished, as shown by subsequent cultivation in nutrient media. If, however, the mixture of magnesia and bacilli be maintained in an atmosphere of hydrogen, or *in vacuo*, they are destroyed as with the metal. This points to the fact that the presence of atmospheric oxygen renders them more resistant to the bactericidal action of magnesia. In this respect magnesium and its oxide behave like zinc, which the author has previously shown to be, under certain circumstances, an active germicide.—Pharm. Journ., April 1, 1905, 484; from Compt. rend., *140* (1905), 273.

Magnesia—Conditions of Formation from Carbonate by Heat.—Magnesia prepared from different substances and by different methods is known to vary greatly in properties, and it is generally supposed that this is due either to variation in the size of the molecule of the oxide, or to a difference in the grouping of the magnesium and oxygen atoms in the molecule, or to both of these causes. W. C. Anderson has conducted experiments on the native magnesium carbonate (magnesite) and on three forms of artificial carbonate with the view of ascertaining (1) the lowest temperature at which the evolution of carbon dioxide could be distinctly recognized; (2) the comparative rates at which the expulsion of the gas takes place at higher temperatures under atmospheric pressure; and (3) the extent to which the samples of magnesia thus obtained dissolve in water after being kept at different known temperatures for a fixed period. This solubility was determined after leaving an excess of the specimen in water for two hours at 20° C. In twenty hours at 350° C., native magnesite yielded a quantity of carbon dioxide equal to 0.40 per cent. of its weight, and the rate of evolution increased rapidly with the rise of temperature. Complete expulsion was reached at about 750° C., with two at least of the artificial carbonates, but only above 810° in the case of the third ("heavy carbonate"). The rate of solution of the magnesia obtained by heating the "heavy carbonate" was found to be greater than that of the samples obtained from "light" and "crystal" carbonate under the same conditions, so long as the heating was little more than that needed for complete decomposition of the carbonates. As the temperatures of preparation were increased, the rate of solution diminished in every instance, but much more rapidly in the case of the "heavy" oxide than in those of the other two. It is inferred from these results that polymerization takes place when magnesia is heated, and that this goes on faster in the dense "heavy" oxide than in the lighter specimens of magnesia. The rate of solution as determined in the experiments is believed to be a measure of the rate of hydration, and this

appears to be most rapid in the molecule $(MgO)_n$ obtained by heating the heavy carbonate at 810° C.—Pharm. Journ., Febr. 25, 1905, 269; from Proc. Chem. Soc., *21* (1905), 11.

Talc—Suitable Condition for Preparing Aromatic Waters.—J. P. Remington, Jr., discusses the use of talc for distributing the volatile oils in the preparation of aromatic waters, calling attention particularly to the disadvantage for this purpose in the ease with which the extremely fine powder is apt to pass through the filter in the process of filtration. He has experimented to overcome this difficulty and finds that a powder that will pass completely through a No. 80 sieve but is retained by a No. 120 is well suited for this purpose. This assures a powder fine enough for the distribution and subsequent solution of the oil, on the one hand, and eliminates, on the other, the fine particles that would otherwise pass through the pores of the filter. He describes the method by which such a powder can be prepared by means of an appropriate mill: but this being obviously impracticable on the scale of ordinary pharmaceutical work, he continued his investigations and proposes a process which accomplishes this, and at the same time purifies the talc. After boiling 100 parts of the finely powdered talc of the market in 1,000 parts of water acidulated with 15 parts of hydrochloric acid, for 15 minutes, allow the powder to settle (generally about 5 minutes) for about three-fourths of the powder to deposit; then pour off the supernatant liquid, containing the lighter (finer? Rep.) particles. This process should be repeated several times (with pure water? Rep.) when it will be found that slighter amounts of very fine powder will remain in suspension at each successive operation. The powder is finally washed on a filter until the washings no longer give a precipitate with silver nitrate T. S., and when thoroughly dried is ready and suitable for the intended use.—Proc. Penna. Pharm. Assoc., 1904, 173–176.

ALUMINUM.

Aluminum Carbonate—Alleged Production.—Heretofore it has not been possible to produce aluminum carbonate—$Al_2(CO_3)_3$—that possesses stability, since it is at the moment of production at once decomposed with elimination of $3CO_2$ and formation of aluminum hydroxide—$2Al(OH)_3$. It is stated that Gawalowsky has now suceeded in producing aluminum carbonate possessing indefinite stability, but no information is given concerning the method of preparation. It is described as being chalk-white, easily powdered, tasteless, readily absorbable, and has been recommended as an astringent, and antidiarrhoicum, and mild styptic.—Pharm. Ztg., *50*, No. 35, (May 3, 1905), 370; from Pharm. Post, 1905, No. 18.

SAMARIUM.

Samarium Chloride—Compound with Ammonia.—According to C. Matignon and R. Tranney, pure anhydrous samarium chloride combines

in the cold with a considerable quantity of gaseous ammonia, becoming whitish and notably increasing in volume. After dissipating the excess of ammonia, and allowing the temperature to rise, definite amounts of the gas are given off at certain markedly distinct temperatures. In this way no less than eight compounds of samarium chloride and ammonia are found to exist:—$SmCl_3.11.5NH_3$, losing NH_3 at 15° C.; $SmCl_3\,9.5NH_3$ at 40° C.; $SmCl_38NH_3$ at 76° C.; $SmCl_35NH_3$ at 105° C.; $SmCl_34NH_3$ at 155° C.; $SmCl_33NH_3$ at 200° C.; $SmCl_32NH_3$ at 240° C.; and $SmCl_3NH_3$ at 375° C.—Pharm. Journ., Feb. 11, 1905, 193; from Compt. rend., *140*, (1905), 141.

INDIUM.

Indium—Properties of Some of its Compounds.—The researches of C. Renz show that a solution of indium chloride, $InCl_3$, in absolute alcohol, when treated with pyridine gives a white crystalline precipitate, or even, in dilute solution, white needles of $InCl_3.3C_5H_5N$, slightly soluble in alcohol, almost insoluble in ether, fusible at 253°. Hydrate of indium is quite insoluble in diethylamine in the presence of a little chlorhydrate, which enables it to be separated from alumina. Oxide of indium calcined for a long time at a bright whitish-red heat in an iridium crucible does not fuse, but becomes converted into a bluish or greyish-white powder containing a number of small cubical crystals. The author admits the existence of two modifications of In_2O_3: 1. The yellow amorphous oxide soluble in acids. 2. The crystalline oxide insoluble in acids. Metallic indium heated with selenium or tellurium unites vigorously, leaving black masses with a metallic lustre in the fracture; there is incandescence in the case of tellurium. —Chem. News, March 17, 1903, 131; from Berichte, *37* (1904), 2110.

THALLIUM.

Thallium—A New Source.—The element thallium, discovered by Sir W. Crookes in 1861, has up to the present been known as an essential constituent of only two minerals, viz., crookesite, a selenide of copper and thallium, and lorandite, a sulpharsenite of the latter element. G. T. Prior now calls attention to a third mineral, hutchinsonite, a new sulpharsinate from the Binnenthal, which also contains thallium as an important constituent. The crystallographic characters of hutchinsonite were described about a year ago by Mr. R. H. Solly, who, of late years, has been particularly successful in discovering new mineral species in the Binnenthal. At the time of its discovery very little in the way of chemical investigation was possible owing to the extreme scarcity of the mineral, but during the past year additional crystals have been acquired for the British Museum, and from these about 80 Mgm. of fairly pure material have been obtained for chemical analysis. Thallium is present (up to nearly 20 per cent.), together with lead, silver and copper, in combination with arsenic and sulphur. A full description of the mineral will appear shortly in the Min-

eralogical Magazine.—Chem. News, April 14, 1905, 176; from Nature, April 6, 1905.

ZINC.

Zinc Dust—Presence of Nitrogen and Oily Impurities.—In the course of experiments upon gums (which see under "Organic Chemistry"), A. B. Stevens found it desirable to confirm the absence of nitrogen from zinc dust. It was found that nitrogen in some form was present in all the samples examined, that this is largely due to absorption from the air, but partly also to the presence of condensation products introduced during the process of its manufacture (which consists in heating zinc oxide with coal). These condensation products were separable by treatment with ether in form of an oil varying in color according to the age of the sample. —Amer. Journ. Pharm., June, 1905, 260–262.

Phosphorescing Zinc Sulphide—Characters.—Following Henry's directions for the preparation of zinc sulphide, H. Grüne could get no uniform results, obtaining preparations which sometimes gave stronger and often weaker phosphorescence. The more the zinc salt was purified the weaker was the blende obtained. The addition of traces of other metallic salts to the pure zinc salt gave strongly phosphorescing sulphides generally. Thus, less than $\frac{1}{100}$ of copper gave a green phosphorescence; silver, lead, bismuth, tin, uranium, cadmium gave good preparations, while iron, nickel, cobalt and chromium gave negative results. Manganese produced very characteristic effects. After illumination preparations of zinc sulphide containing traces of manganese phosphoresced with a reddish-yellow light; rubbing or scratching caused an extraordinarily strong luminescence which could not be seen even by daylight. When in the state of the finest powder the preparation phosphoresced under gentle pressure. Preparations containing other metals, *e. g.*, copper or uranium, showed this kind of phosphorescence, but to a much slighter extent.—Chem. News, Nov. 4, 1904, 233; from Berichte, *37*, No. 13, 1904.

CHROMIUM.

Chromous Salts—Action of Nitric Oxide.—V. Kohlschütter observes that three molecules of chromous chloride absorb from 1.2 to 0.87 molecules of nitric oxide, the color of the solution changing to dark-red. This was supposed to be due to the formation of the compound $(CrCl_2)_3NO$, which is very stable, absorbs no more oxygen, and does not give up NO on heating or *in vacuo*. But the author has found that this red solution gives only chromic reactions, and that nothing points to the presence in it of a NO group. Its color slowly changes in the cold (rapidly on heating or on addition of acids) to a tint between olive-green and brownish-red. The freshly prepared dark-red solution was distilled with alkaline permanganate solution: (1) Directly, and (2) after being previously warmed with hydrochloric acid, and the ammonia thus formed was determined by

titration. Since alkaline permanganate decomposes hydroxylamine, if any of the latter compound were formed on acidulation the ammonia formed in the second case would be less in quantity than in the first. But it was found that the same amount of ammonia was formed in both cases. Hence, the color change on addition of acid does not show the decomposition of a nitric oxide compound, but proves that ammonia and hydroxylamine are present in definite amounts in the red solution. Thus the absorption of nitric oxide by chromous chloride depends upon its reduction to soluble compounds—ammonia in neutral solutions or hydroxylamine in acid solutions. More chromous chloride is necessary to convert a given quantity of NO to ammonia than to hydroxylamine, and this agrees with the fact that the same chromous solution absorbs less NO in neutral than in acid solution. Nothing definite can be said regarding the nature of the red solution; perhaps it is a solution of a basic chromic salt which, like the sulphate or chloride, can pass into other hydrated forms.—Chem. News, Nov. 4, 1904, 233; from Bericht, *37*, No. 13, 1904.

Green Chromic Sulphate—Investigation of a Reaction.—The isomerism of the violet and green sulphate of chromium being established, Albert Colson finds—in the green salt—that the acid is less energetically fixed on to the chromium than in the violet salt. This discovery seems to indicate the fact that the decomposition of the green sulphate is easy. He finds, however, that, in reality, it is irregular, and his experiments lead to an investigation of one aspect of the question of dissimulated radicals, and the fact is discovered that the dissimulation of a radical is closely connected with the velocity of reactions.—Chem. News, June 30, 1905, 304; from Compt. rend., *140*, No. 22 (May 29, 1905).

IRON.

Ferrum Redactum—Unsatisfactory Quality.—The recent agitation of the subject of arsenic content observed in commercial samples of reduced iron leads F. H. Alcock to mention that in his experience arsenic has always been present in this preparation, but that little attention has been given to its presence because no mention is made of it in the B. P. monogram. He has recently met with samples containing very little arsenic, but which, on the other hand, were incompletely soluble in HCl. In one specimen the insoluble matter amounted to 2.75 per cent., this being the best of half a dozen examined. Other samples left as much as 7.5 per cent. of residue on treatment with HCl—evidently mineral matter partaking of the nature of silica or silicates.—Pharm. Journ., Dec. 10, 1904, 852.

Iron—Quinosol a Characteristic Reagent.—Bornträger finds that the well-known antiseptic quinosol affords an excellent and characteristic reagent for iron, which has proven particularly useful for its determination in mineral waters. In the presence of ferrous oxide such waters are colored black-green in alkaline solution, while in acid solution the quinosol simply

colors the water light yellow, changing, however, to black-green on addition of alkali if ferrous oxide is present.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 864; from Allg. Chem. Ztg., 1904, No. 37.

MANGANESE.

Manganese Sulphate—Spontaneous Separation of Iron from its Impure Solution.—George Krüner calls attention to the spontaneous separation of iron from a solution of manganese sulphate containing a very small percentage of the impurity, being a portion set aside lightly covered while the major portion was being treated by the usual methods of purification. The solution of manganese sulphate contained originally 26.95 per cent. $MnSO_4$ and only 0.006 per cent. Fe in the form of ferrous sulphate, and was perfectly neutral, but gave a distict reaction for iron. On standing the amethyst-colored, perfectly clear solution became slightly turbid and assumed a brownish tinge; it was filtered and the slight precipitate on the filter examined. It proved to be a basic sulphate, probably of the formula $Fe_2O(SO_4)_2$, while the new clear filtrate was found absolutely free from iron. The author regards this spontaneous separation of iron from the manganese salt to be due to catalytic action—the manganese, whose ions have, as is well known, a tendency to higher oxidation, acting as a carrier of atmospheric oxygen to the readily oxidizable ferrous compound and converting the latter quantitatively into the ferric combination. The author considers it quite possible that this observation may be of practical use in the industrial purification of manganese salts from iron. Whether the concentration of the solution, which was nearly saturated, is a necessary condition, it is essential that the solution shall be perfectly neutral and the iron present in the ferrous form. If in the ferric condition it must first be reduced to the ferrous.

URANIUM.

Uranium Nitrate—Caution Concerning its Therapeutic Use.—Tylecote observes that while uranium nitrate has been found useful for local applications (in solutions of 0.15 in 30.0) in boils and abrasions, dependent on its hæmostatic and astringent properties, and has been found efficient also in obstinate cases of gonorrhœa, and as spray in inflammations of the throat, it must be employed with great care for internal treatment, because of its liability to give rise to albuminuria. The initial dose should not exceed 0.075, given thrice daily, largely diluted with water.—Pharm. Ztg., *49*, No. 96 (Nov. 30, 1904), 1022; from Münch. Med. Wsch., 1904, No. 36.

Referring to the above, Prof. Kobert calls attention to the fact that it has been shown by one of his students, Woroschilsky (1890), that, leaving phosphorus and radium out of consideration, *uranium must be regarded as being the most poisonous of all elements.* While its external use is probably justified because of its potency as an astringent and as a powerful precipi-

tant of albumen, there are no pharmacologic indications so far mentioned that would seem to justify its internal use, and he therefore not only advises against its therapeutic use in general, but seriously warns against its use for internal purposes.—Pharm. Ztg., *49*, No. 98 (Dec. 7, 1905), 1041.

TIN.

Perstannic Acid and Salts—Preparation and Properties.—S. Tanatar finds that if stannic acid, precipitated from tin chloride solution by means of soda, and well washed, is rubbed up with twice as much 30 per cent. hydrogen peroxide as is theoretically necessary to convert it into perstannic acid, and the mass is then dried at 70° C. on the water-bath till it becomes pasty and begins to crack, after a few days' drying in the desiccator it is converted into a white amorphous powder, with the formula $HSnO_4 + 2H_2O$. It loses water and oxygen slowly in the desiccator, and is only very slightly soluble in water, which partially decomposes it into hydrogen peroxide and stannic acid. After being dried at 100° C., its composition is represented by the formula $H_2Sn_2O_7 + 3H_2O$. Potassium perstannate is prepared by cooling a mixture of a solution of potassium stannate and 30 per cent. hydrogen peroxide with ice-water, and precipitating with alcohol. After washing with alcohol and ether, and drying in the desiccator, a white amorphous powder is obtained, which loses oxygen and water on ignition. The aqueous solution of the salt is alkaline, and contains some free hydrogen peroxide. Continued drying converts it into $K_2Sn_2O_7 + 3H_2O$. Sodium perstannate is prepared similarly, but being almost insoluble in water it is precipitated more readily. The solution of potassium perstannate gives precipitates with Ba, Sr, Mg, Zn, Ni, Co and Pt salts; these precipitates are mixtures of the hydroxides of the metals with perstannates. With the exception of the barium and strontium perstannate they are decomposed by water, oxygen being evolved.—Chem. News, June 16, 1905, 280; from Berichte, *38* (1905), No. 5.

TITANIUM.

Titanium—Hydrates of its Trihaloid Salts.—Arthur Stähler finds that in its trivalent compounds titanium behaves like vanadium and chromium. Thus it may be conjectured that in vanadium and titanium trichloride an isomerism exists similar to that existing between the violet (grey-blue) and green, $CrCl_3.6H_2O$, described by Werner as hydrate isomerism. Twenty-eight years ago Glatzel isolated from the hydrochloric acid solution of titanium a green substance to which he gave the formula $TiCl_3.4H_2O$. Five years ago Polidori obtained a violet salt, $TiCl_3.6H_2O$, by electrolytic reduction of the tetra-chloride. The author, in spite of repeated attempts, could not get Glatzel's green chloride. The concentrated solution of the violet trichloride became green on the addition of alcohol and hydrochloric acid. This liquid gave no crystals of a green hydrate.

But on addition of rubidium or cæsium chloride to it, fairly stable double salts could be isolated, of composition $TiCl_3Cs_2.H_2O$ or $TiCl_5Rb_2.H_2O$. They separate in a pure condition only from the hot solution, and are decomposed by water, giving a violet solution. The chromium chloride salts of Neumann behave similarly, except that they were violet, giving a green solution in water. Chromium chloride also forms a series of green double salts which exist in the cold, and dissolve in water without change. The author has not obtained green-violet salts of this type, though similar violet salts seem to exist, or at any rate, from violet titanium chloride by addition of cæsium chloride in the cold, violet double salts were formed which have, approximately, the composition $TiCl_3Cs_2.4H_2O$, but which cannot be isolated quite pure. By determining the chlorine which could be precipitated and the lowering of the freezing-point it was found that, as regards dissociation, the violet titanium chloride agrees very well with the violet chromium chloride. The author has prepared by the electrolytic reduction of the tetrabromide and the tetraiodide the hydrates of the trihaloid salts, which are violet, and have the composition $TiBr_3.6H_2O$ and $TiI_3.6H_2O$. They are both less stable than the chloride, the bromide being more stable than the iodide. The bromide may be kept for a day *in vacuo* with only slight loss of weight, while the iodide in a shorter time becomes green, giving off water and hydriodic acid.—Chem. News, Jan. 6, 1905, 10; from Berichte, *37* (1904), No. 16.

THORIUM.

Thorium—Salts of Certain Organic Acids.—G. T. Morgan, with the object of obtaining salts which might prove convenient media for the therapeutic application of thorium, has prepared and describes a number of compounds with the organic acids, the starting point being a specimen of Kahlbaum's crystallized thorium nitrate ; which on analysis was found to have the composition expressed by the formula $Th(NO_3)4.4H_2O$. He found that many of the carboxylic acids form insoluble salts, which may be produced by the interaction of the soluble alkali salt of the acid with thorium nitrate in aqueous solution and washing the product with warm water until free from any excess of their generators. In this way, *Thorium salicylate*, when dried on a porous tile at the ordinary temperature, was obtained as an insoluble pulverulent substance. *Thorium cinnamate* and *Thorium coumarate*, are similar in their nature; and similar insoluble compounds are produced in combining thoria, in form of thoria hydrate, with oleic acid and with phenol and its homologues. Lactic acid, on the other hand, furnished a soluble salt, which separated from its highly concentrated solutions in opaque-white, tabular, somewhat deliquescent crystals. The thorium salts of the sulphonated aromatic hydrocarbons are extremely soluble in water—*Thorium benzenesulphonate*, for example, forming small colorless crystals on evaporating its aqueous solution nearly to dryness. *Thorium napthalene-*

a-sulphonate is also very soluble in water, but *T. napthalene-β-sulphonate* is somewhat less soluble. *Thorium phenol-p-sulphonate* (Thorium Sulphocarbolate), separates from its concentrated aqueous solutions in well-defined pale pink, transparent prisms, often of considerable size and is quite permanent under ordinary conditions.—Pharm. Journ., Oct. 1, 1904, 472.

ZIRCONIUM.

Zirconium—New Iodo Compounds.—A. Staehler and B. Denk state that by heating metallic zirconium to about 340° C. in a stream of hydriodic acid, and removing free iodine from the product by treatment with benzene, zirconium tetraiodide, ZrI_4, has been obtained as a reddish-brown powder, which, under the microscope, shows a yellow crystalline structure. It fumes in the air, and dissolves in water and acids with violent reaction. It appears to be soluble in absolute ether. The product of the action of water on this body is zirconium oxyiodide, $ZrOI_3.8H_2O$. This is also obtained by dissolving hydrated zirconium oxide in strong hydriodic acid. The solution is filtered through asbestos, and evaporated in an atmosphere of carbon dioxide; on cooling it forms colorless needles, which are very hygroscopic, and readily soluble in water and in alcohol.—Pharm. Journ., Jan. 14, 1905, 37; from Berichte, *37*, (1904), 1135.

COPPER.

Copper—Occurrence in Jamaica.—E. M. Holmes describes a specimen of copper ore, presented to the Museum of the Pharmaceutical Society by Dr. A. B. Griffiths, obtained from the Retreat, Clarendon, Jamaica. The hills of Clarendon appear to contain veins of grey copper sulphide and carbonate. The analysis of this ore is as follows:—Copper, 38.2; iron, 11.0 per cent, with 9½ ounces of silver, and 90 grains of gold, per ton of ore.—Pharm. Journ., Dec. 17, 1904, 893.

Copper—Comparative Non-Toxicity.—In further elucidation of the problem of the purification of the water supplies by means of copper (see "Water") Professor Kraemer solicited the opinion of a number of pharmacologists, among them Professors H. A. Hare and J. W. Holland, respecting the probable poisonous effects of the copper. The consensus of opinion seems to point to the non-toxicity of copper in such water, or, in fact, even in doses much larger than are likely to be consumed during a whole day.—Amer. Journ. Pharm., Dec., 1904, 580, 581.

Copper—Quantity Present in Foods.—In connection with his review of the researches on subjects bearing on the copper treatment of water (which see under "Hydrogen"), Prof. Kraemer publishes an exhaustive table exhibiting the amounts of copper that may be present naturally in foods and other products of vegetable or animal origin.—Amer. Journ. Pharm., June, 1905, 274–277.

MERCURY.

Mercury—Volumetric Method of Determination of Its Organic Compounds.—E. Rupp and Th. Nöll have experimented to establish a volumetric method for the determination of mercury in its organic compounds, and as a result recommend the following method for its determination in the official *Hydragyrum salicylicum*, as being more rapid and more accurate than the gravimetric method in the German Pharmacopœia: 0.3 Gm. of the salicylate is heated with 4.0 Gm. of potassium sulphate and 5 Cc. of concentrated sulphuric acid in a 150 Cc. flask, resting on wire gauze, and provided with an oblique reflux tube about 50 Cm. long. As soon as the mixture is clear and colorless, the reflux tube is rinsed out with 5 to 10 Cc. of sulphuric acid, and 0.1 to 0.2 Gm. of potassium permanganate added. The heating is renewed until the solution is colorless. The whole is now diluted to 100 Cc. and titrated with decinormal sulphocyanide, using iron-alum as indicator, until a reddish-brown color appears; 1 Cc.=0.010015 Gm. of mercury. The method is applicable to other organic mercurial compounds.—Arch. d. Pharm., *243*, No. 1 (Feb. 27, 1905), 1–5.

Mercury—Prevention of Poisoning by Its Vapor.—The remarkable power of aluminum to completely absorb the vapor of mercury even when highly diluted with air, and at the ordinary temperature, is made by N. Tarugi the basis of an extremely delicate test for mercury, and of a preventive measure against poisoning by mercury vapor. A species of respirator has been patented in which the air that is inhaled is made to pass through a mass of finely divided aluminum; in this passage every trace of mercury is absorbed, the action being so complete that the dense vapors evolved by heated mercuric chloride may be breathed with impunity. The respirator has already been introduced with good results into the mercury mines of Monte Amiata.—Pharm. Journ., March, 1905, 367; from Gazetta, Jan. 14, 1905.

Calomel—Presence of Crystals in the Powder.—Wijne directs attention to the occasional occurrence of crystalline calomel in the commercial powdered form, which is probably due to gradual accumulation on the bottom of the storage vessels. The presence of such crystals has not infrequently given rise to unpleasant consequences when such contaminated calomel was employed for dusting into the eyes.—Pharm. Ztg., *50*, No. 35 (May 5, 1905), 369; from Pharm. Weeklb., 1905, No. 14.

ARSENIC.

Arsenic—Determination by Reinsch's Test.—R. C. Cowley and J. P. Catford, leaving out, for the present, the consideration of other tests that have recently been discovered for possible adoption in the B. P., call attention to the simplest of all tests—that of Reinsch. Among the advantages of this test is the important one that all the arsenic is retained and

precipitated as solid arsenide of copper, thus concentrating it into a small space. The manner of applying this test as described in text-books varies little from the primative method of the originator (in 1842), and so has not been credited with the precision it is capable of. After numerous experiments undertaken to eliminate some objectionable features connected with this test, the authors have been so far successful as to be able to assert that it is possible to definitely measure to the $\frac{1}{30}$ of a milligramme, or even to the $\frac{1}{5000}$ of a grain, by proceeding on the following lines:

A few inches of fine copper wire, coiled into a helix by twisting it around a glass tube, is immersed in 10 Cc. of the liquid to be tested, to which one-fifth of its volume of hydrochloric acid has been added. The liquid and acid are contained in a test-tube, which is supported upright in a salt water-bath by means of a loop of wire resting on the edges of the bath. The coil of copper wire is arranged so that it shall reach from the bottom of the arsenical liquid to above its surface. The test-tube must be immersed in the salt-water bath so that the liquid it contains shall be below the level of the liquid in the bath; the bath is to be kept simmering without, however, reaching the boiling-point, for about an hour. The projecting extremity of the copper is now to be pressed down below the surface of the liquid, and if it remains bright after continuing the application of heat for another fifteen minutes, the arsenic will be all removed from the liquid, and the wire may be removed to a small dish, rinsed without touching it with the fingers, and the deposit then dissolved off by a cubic centimeter of bromine water containing a little hydrobromic acid. The clean wire is lifted out, rinsed with water, and if thought necessary may be returned to the acid liquid to make sure that all the arsenic has been deposited from it. The bromine solution now contains the arsenic as arsenous acid. To it 1 Cc. of solution of potash is added, and the liquid is boiled until the light green copper compounds are broken up. During this treatment the cupric oxide formed as an intermediate compound oxidizes the arsenic, and a solution of the alkaline arsenate results, which is filtered from the copper oxides. An aliquot part of the filtrate may be reserved and tested for arsenic acid by the molybdate reagent after evaporation; the remainder is reduced again to arsenite and titrated with $\frac{N}{100}$, or other suitably weak solution of iodine. A solution of iodine of convenient strength is made by diluting 10 Cc. of $\frac{N}{10}$ solution to about 150 Cc., and comparing it with a standard arsenical solution. The equivalent may be adjusted as follows:

N/150 Iodine.

Either 3 Cc. = 0.001 Gm.
or 2 Cc. = 0.01 grain.
Then 0.04 Cc. = 0.0002 grain, or 1/5000 grain or 0.000013 Gm. = 13/1000 of a milligramme.

For a burette the authors use a pipette graduated in hundredths of a cubic centimeter. To control the flow, a piece of rubber tubing is slipped on the upper end and compressed by a screw clamp. One hundredth part of a cubic centimeter (or a "centimil," as it has been proposed to be called) of the iodine solution gives the blue color with starch in a volume of liquid not exceeding 10 Cc., but, as in the ordinary burette, too much importance should not be placed on a single tenth of a cubic centimeter, so with the centimil pipette 0.04 is perhaps a fair limit of reliability.—Pharm. Journ., Dec. 17, 1904, 897.

Arsenic—Extension of Gutzeit's Test to Substances Yielding SH_2 *or* PH_3.—The well-known disadvantages of arsenic determinations by Gutzeit's test in the presence of hydrogen sulphide or hydrogen phosphide, or substances yielding these, may be overcome according to H. Strauss by a preliminary oxidation of the substance under examination with potassium chlorate and hydrochloric acid. It must be remembered, however, that owing to the ready volatilization of arsenous chloride, it is necessary to add the potassium chlorate in sufficient quantity for the complete oxidation of the material before applying heat. The excess of chlorine is readily driven off by heat, the entire operation being readily carried out in a test-tube. After cooling, the Gutzeit test may then be applied in the usual manner.—Pharm. Ztg. *50*, No. 9 (Febr. 1, 1905), 91; from Chem. Ztg., 1905, No. 5.

Arsenic—Removal from Alkali Nitrates.—In connection with some critical studies concerning the determination of arsenic by Marsh's method, which are described in detail, accompanied by an explanatory illustration, Y. Lockemann recommends the following simple process for preparing perfectly

Arsenic-free Potassium and Sodium Nitrate, neither of which, he claims, are found in commerce: A solution of 250 Gm. of the nitrate in 1 liter of water is mixed with 25 Cc. of normal volumetric solution of aluminum sulphate, while stirring, and is then heated with ammonia for about an hour on the water-bath. The precipitated hydroxide is then removed by filtration, and the operation is repeated with the filtrate several times, until the final precipitate, after solution in diluted sulphuric acid and elimination of liberated nitric acid by heating, proves to be free from arsenic on applying Marsh's test. The method is well adapted for the removal of the smallest quantities of arsenic, and may be applied to operations on a large scale, requiring a relatively short time, the salt being finally crystallized and obtained perfectly pure.—Pharm. Ztg., *50*, No. 27 (April 5, 1905), 281; from Ztschr. f. angew. Chem., 1905, No. 11.

Arsenic—Separation from Antimony.—G. T. Morgan describes a modification of the apparatus of Piloty and Stock for the separation of arsenic from antimony by distillation in hydrogen chloride, in which the mixed sulphides of arsenic and antimony were distilled in a current of hydrogen

chloride, so that the vapors did not come into contact with organic matter until after passing through a cooled aqueous solution of hydrogen sulphide. In dealing with a mixture containing arsenic in the two states of oxidation, the distillation was first carried out in hydrogen chloride, when the arsenious sulphide precipitated in the receiver represented the tervalent arsenic. On repeating the distillation of the residual liquid in a current of hydrogen chloride mixed with hydrogen sulphide a second precipitation of arsenous sulphide was obtained, this being derived from the arsenic originally present in the quinquevalent condition.—Pharm. Journ., July 9, 1904, 42; from Proc. Chem. Soc., 20, 167.

Hydrogen Arsenide, Antimonide and Phosphide—Reaction and Differentiation with Potassium-Mercuric Iodide.—When a stream of hydrogen phosphide diluted with an inert gas, such as hydrogen or carbon dioxide, is slowly passed into a neutral solution of potassium-mercuric iodide, a crystalline precipitate, at first yellow, but ultimately red is gradually formed, and continues until all the mercury has been precipitated. According to P. Lemoult, this body has the composition PHg_3I_3, and is formed according to the equation, $PH_3 + 3HgI_2 = 3HI + PHg_3I_3$. The same body is found much more rapidly, but in an amorphous condition if the hydrogen phosphide is undiluted when passed into the mercuric solution. Hydrogen arsenide acts in a similar manner, forming a bright brown crystalline precipitate of $AsHg_3I_3$. It is more slowly formed than the phosphorus compound; it is unaffected by alkalies, whereas PHg_3I_3 is at once decomposed by alkaline solutions. Hydrogen antimonide, under similar conditions, slowly forms blackish-brown crystals $SbHg_3I_3$.—Pharm. Journ., Oct. 22, 1904, 583; from Comp. rend., 139, 478.

Ferrous Arsenate—Instability.—William Duncan, reviewing the processes for the preparation of ferrous arsenate in the different Pharmacopœias, finds that they do not materially differ from each other or from that of the B. P. The trouble with this salt does not lie in preparing it, but in keeping it, and it is remarkable that so insoluble a salt as ferrous arsenate so readily oxidizes when compared with the other ferrous salts. If, therefore, a combination of iron and arsenic be a pharmacopœial necessity, it would in the author's opinion be better to replace the present ferrous arsenate by the more stable ferric arsenate; for, although it is generally believed that ferrous iron is more medicinally active than ferric, few prescribe the salt for its iron, but for the arsenic.—Pharm. Journ., Jan. 21, 1905, 71–72.

BISMUTH.

Bismuth—Characteristic Reaction with Brucine.—C. Reichard calls attention to a remarkable reaction of bismuth with pure brucine or its sulphate which enables the detection of mere traces of the metal, even in the presence of antimony. He finds that if a little brucine, dry or in concentrated solution, is brought in contact with a drop of concentrated bis-

muth solution in a porcelain dish, a magnificent red color, of great intensity, is developed. On diluting with a drop of hydrochloric acid, and heating until evaporated, the intensity of color is increased and remains permanent when completely dry. The addition of water with a little hydrochloric acid, then produces a red solution of great intensity and quite permanent. An excess of brucine is necessary to produce a permanent reaction, which is otherwise fugitive. While antimony will also produce a red color with brucine, it will only do so on heating, whereas the reaction with bismuth results in the cold.—Pharm. Ztg., *49*, No. 89 (Nov. 5, 1904), 947; from Chem. Ztg., 1904, No. 86.

VANADIUM.

Vanadium—Extraction from Natural Lead Vanadate.—H. Hessenschmidt describes the method of extracting vanadium from naturally occurring lead vanadate, from the Santa Maria Mines, Spain. The mineral was smelted with coal and carbonate of soda in a reverberatory furnace. Metalic lead was formed, and a slag consisting of vanadate, aluminate and silicate of sodium. To render this slag soluble in water, it was re-melted and air was blown into the melted mass until the vanadium was completely peroxidised. On treatment with water, 95 per cent. of the vanadium present in the mineral went into solution. After precipitating out the silica, the solution was concentrated and the vanadic acid precipitated by means of sulphuric acid.—Chem News, Nov. 25, 1904, 269; Compt. rend. *139*, No. 17, Oct. 24, 1904.

Vanadium Trichloride Hydrate—Formation of Red Compounds.—Arthur Stähler finds that on dissolving $VdCl_3.6H_2O$ (prepared electrolytically) and rubidium chloride in water, and evaporating on the water-bath, hydrochloric acid being introduced, raspberry-red crystals separate out. These on analysis corresponded to the formula $VdCl_5Rb_2.H_2O$. The salt is difficultly soluble in water and alcohol, and gradually changes in water, giving a green solution. Corresponding compounds of ammonium, potassium, cæsium, and magnesium are also red, and possess the same properties. —Chem. News. Jan. 6, 1905, 10; from Berichte, *37* (1904), No. 16.

SILVER.

Silver—Separation from Lead.—The separation of silver from lead by the method which depends upon the different behavior of their iodides towards dilute nitric acid is not satisfactory when small quantities of silver are present in much lead. H. J. Lidholm found that this is very tedious, and also requires considerable skill. The separation of small quantities of silver from much lead cannot be performed by removing the lead either by means of hydrogen peroxide or potassium dichromate in alkaline solution. He has devised a method of separation depending upon the fact that many organic compounds, especially phenols, reduce silver from its solu-

tions, while most phenols give very difficultly soluble phenolates with lead. Hydroquinone, however, does not precipitate lead. Silver is not separated quantitatively if the solution contains free mineral acids, but all the silver will be precipitated if sodium acetate is added to the nearly neutral solutions, so that the only free acid present is acetic acid. The alloy or mineral is dissolved in the usual way with the addition of tartaric acid, the solution filtered and neutralized, and the sodium acetate added. Any precipitate of basic lead acetate thus formed is dissolved in acetic acid, and the solution heated to boiling. Then some Cc. of hydroquinone solution are added (2 Cc. of a 4 per cent. hydroquinone solution are sufficient to reduce 0.1 Gm. Ag), when the silver separates out instantly. It is then allowed to stand and filter, the precipitate being washed with water containing some ammonium nitrate to facilitate filtration. The silver is then dried, ignited in a porcelain crucible and weighed. Of other metals of the same group, cadmium does not affect this method of separation; copper is partly reduced and partly precipitated as phenolate, and bismuth is partly reduced. Hence, if these metals are present, after the method has been carried out exactly as above, any bismuth compounds separated out are removed by filtration. The filtrate is precipitated with hydroquinone, the precipitate brought on to the filter, and dried and ignited, and then introduced into a beaker. The residue is dissolved in nitric acid, and the nitrates formed are washed into the beaker. Some Cc. of concentrated nitric acid are now added to dissolve the whole, and the silver is precipitated with hydrochloric acid. The precipitate, which contains silver chloride as well as basic bismuth chloride, is separated off; it may then be treated by Fresenius's method. The other metals of the group can be determined in the usual way after the silver has been separated. The method is accurate, even if only 0.01 per cent. of silver is present in the lead.—Chem. News, May 12, 1905, 223; from Berichte, *38* (1905), No. 2.

Colloidal Silver Salts—Formation, Etc.—In continuing their researches on colloidal silver oxide, C. Paal and Franz Voss have found that if silver salts of protalbinic or lysalbinic acid, which are formed when white of egg is subjected to alkaline hydrolysis, are dissolved in sodium carbonate solution, the excess of sodium carbonate removed by dialysis, and the liquid cautiously evaporated to dryness, the sodium salt of the acid is formed and a colloidal silver carbonate. They have also prepared colloidal sulphide, bromide, and iodide of silver.—Chem. News, Dec. 16, 1904, 304; from Berichte, *37* (1904), No. 15.

GOLD.

Crystalline Gold—Production by Precipitation.—In the course of some experiments with uranium nitrate, $UO.NO_3$, Robert Dykes obtained a crystalline precipitate of metallic gold in the following manner: To about

5 C.c. of a saturated solution of uranium nitrate, a similar quantity of auric chloride, $AuCl_3$, was added. The solution was evaporated to dryness, and the mixed salts dissolved in ether and again evaporated. When reduced to a small bulk the solution now changed from pale yellow to orange-red, and became viscous; on adding a few drops of distilled water and proceeding with the evaporation, a bright yellow scintillating precipitate was formed. This, when washed and suspended in water, took some moments to settle, and although heavy was easily disturbed. Under the microscope it was seen to consist wholly of exceedingly brilliant, metallic crystals, brassy yellow in color, and proved to consist of pure metallic gold. —Chem. News, April 20, 1905, 181.

Gold Colloids—Formation and Properties.—L. Vanino has made researches on the formation and properties of various gold colloids. He finds that ordinary alcohol can be used for producing colloid.

Gold Hydrosols—Absolute alcohol does not act upon gold chloride, but if an alcoholic gold solution is poured into water a hydrosol is formed. Gold chloride must be present; auro-chloride of sodium only acts in very dilute solution, no reaction occurring in concentrated solution. Methyl alcohol also produces similar colloid hydrosols. The author finds furthermore, that in cold water

Auroso-auric Oxide gives a fine suspension of very small particles, but does not dissolve. This may readily be proved by simply shaking up with kieselguhr or barium sulphate, and by making use of Pukall's clay filter. Barium sulphate or kieselguhr easily bring down the suspended oxide which is retained by the clay filter. Muthmann's method of identifying a suspension by means of gum arabic also proves that the so-called solution is a colloid suspension similar to that obtained by treating a ferric salt with ammonia in the cold.—Chem. News, May 12, 1905, 222; from Berichte, *38* (1905), No. 2.

ORGANIC CHEMISTRY.

HYDROCARBONS.

(Including Volatile Oils and Derivatives.)

"Abietene"—Presence in Pinus Jeffreyi, Murray.—In 1871 Prof. Wm. T. Wenzell first called attention to the peculiar properties of the hydrocarbon which constituted the bulk of the volatile oil, designated as "abietene," obtained from a California conifer, *Pinus sabiniana* Dougl., known on the Pacific coast as the Digger pine. This hydrocarbon differed ma-

terially in its properties from those of pinene, the principal constituent of the more commonly known turpentine oils, by its inertness towards chemical reagents in general, as was pointed out at the time by Prof. Wenzell, and subsequently confirmed by Thorpe (see Proceedings 1879, 385), who carefully examined the physical properties and determined the elementary composition of the new hydrocarbon, and pronounced it to be identical with normal heptane. Later it was shown that a like product was obtained from *Pinus Jeffreyi*, and this gave rise to confusion respecting the source of a product the existence of which had been received with surprise and skepticism—the latter due to the announcement of the presence of a hydrocarbon of the methane series in a coniferous oil. In order to remove all doubt as to the occurrence of normal heptane in the conifers of the Pacific coast, Professor Wenzell now communicates historical and other data which must prove convincing even to the most skeptic. He has, moreover, personally collected the oleoresin from *Pinus sabiniana*, from *Pinus Coulteri*, a species found growing in the same localities along with the former and known as the "big cone pine," and from *Pinus Jeffreyi* and has distilled the oils from them. The distillate from *P. sabiniana* and *P. Jeffreyi* possessed all the physical properties of "abietene," whereas that obtained from the "big cone pine," *P. Coulteri* showed those of a terpene.—Pharm. Rev., Nov., 1904, 408-414.

Anisol—A New Iodine Derivative.—Among other iodoform substitutes that possess advantages for preparing gauzes and bandages, P. Zelle describes *p*-iodanisol, which has been introduced under the trade name

Isoform.—It is obtained by the oxidation of iodanisol, and described as forming nearly odorless, silvery, shining, crystaline scales, which are difficultly soluble in cold water, somewhat more soluble in hot water, but insoluble in ether and in alcohol. While stable under ordinary conditions, isoform has the unpleasant property of exploding when heated above 200° C. On this account it is supplied in commerce in the form of

Isoform-Paste, obtained by triturating the crystals with an equal weight of glycerin, and also in the form of a powder, composed of isoform and an equal weight of calcium phosphate. The author gives formulas for preparing gauzes, cotton, and other bandaging material, containing isoform in variable percentages. Pharm. Ztg., *49*, No. 97 (Dec. 3 1904), 1031.

Benzonaphthol—Tests of Quality and Identity.—K. Alpers, in view of the substitution and adulteration of benzonaphthol with mixtures of benzoic acid and naphthol, calls attention to methods for their detection. The absence of free naphthol is determined by heating the chloroform solution of the suspected substance with caustic alkali, which produces no coloration with pure benzonaphthol. Free benzoic acid is detected by its abundant solubility in cold alcohol; naphthalin by its odor. According to Klut the most reliable criterion of the purity of benzonaphthol is the melt-

ing-point which should be at 110°C.—Pharm. Ztg., *49*, No. 57, (July 15, 1904), 600.

Cadineïn— Characters.—According to Heinrich Haensel's Report, the name "cadineïn" has been given to the volatile oil distilled from Oil of Cade, the latter, as is known, being a tar-like product obtained in the South of France, by the dry distillation of the wood and branches of *Juniperus oxycedrus*. Cadineïn has the sp. gr. 0.9610, forms a not quite clear solution with 35 parts of 80 per cent. alcohol, and contains from 15 to 20 per cent of phenols; but the "cadinene" obtained by Wallach from Oil of Cade was not found in it.—Pharm. Ztg., *50*, No. 6, (Jan. 21 1905), 61.

Synthetic Camphor—Present Prospects.—James C. Richardson says that a few months ago it was thought that the strong position held by the natural camphor would be threatened by the introduction of the synthetic product from the United States, but subsequent facts have proved in this case, as in so many others, that the hopes held out have not by any means been realized, or even approximated to. Camphor can, of course, now be made in the laboratory, and turned out in small samples for the waistcoat-pocket, and these possess, for most practical purposes, all, or very nearly all, the chemical and physical properties of the natural article. In one case, however, strangely enough, the condition of the stuff was not quite satisfactory for celluloid-manufacture, it being too brittle, and it is just possible that it may have been over-purified. However, to the author's knowledge, several men have been living on the manufacture of samples of *artificial* camphor, "nosed" with the natural article by distilling the two together. These samples have been, and even a few days since were, put forward as "camphor," which could be made at 4*d.* per pound! The utilisation of the by-products in synthetic-camphor manufacture is a very important matter if ever it is to be made a commercial success. Some of the oils have already found useful applications, but they are still in the experimental stage. Synthetic camphor is being made in comparatively small quantities in America, in Germany, and in this country. Many of the samples submitted are quite passable; but, industrially, great economies must be effected, as already indicated, before they will have any real competitive value. If the synthetic article can compete at all with natural camphor at present market-prices, which is indeed very doubtful, looking upon the best of them and in the most favorable light, will it be able to compete at a lower price, and how much lower?—Chem. & Drugg., Nov. 19, 1904, 850.

Synthetic Camphor—Production from Turpentine Oil by Means of Salicylic Acid.—Now that the synthetic production of camphor from turpentine oil by the intervention of oxalic acid has become an accomplished fact, it is mentioned in "Rép. de Pharm." (1904, No. 8), that Tardy has succeeded years ago in producing camphor by the intervention of salicylic

acid. A mixture of equal parts of salicylic acid and oil of turpentine is heated at 150° C. for 50 hours; the excess of salicylic acid is removed with caustic soda solution, and the residue subjected to fractional distillation. A mixture of esters, largely composed of salicylic acid bornyl ester is obtained, the latter yielding borneol on saponification, while the salicylic acid may be recovered for future use.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 770.

Nitroso-Carvacrol—Physical and Chemical Properties.—E. Kremers and I. W. Brandel have made a comprehensive study of the nature, physical and chemical properties and molecular weight of nitroso-carvacrol, with particular reference to the corresponding derivative of thymol—nitrosothymol. The authors review its history, the numerous methods that have been proposed and used for its preparation and purification, describe its physical constants, and give the results of their own experiments and observations concerning its molecular weight, the products of its reaction with metals, with phenylhydrazine, with oxidizing agents and with reducing agents.—Pharm. Rev., July and Aug., 1904, 248–255 and 290–292.

Ceresin—Artificial Coloring and Detection.—F. Utz finds that the ceresins of commerce are frequently colored with coal-tar colors—particularly those characterized by a dark orange, orange, light orange and lemon-yellow. To detect these, it suffices to dissolve the sample in benzin, and to shake the solution with 90 per cent. alcohol, which dissolves the coloring matters forming an orange-yellow or yellow liquid, becoming red on addition of a little hydrochloric acid. Natural ceresins communicate no color to the alcohol.—Pharm. Ztg., *49*, No. 97 (Dec. 3, 1904), 1031; from Œsterr. Chem., Ztg., 1904, No. 22.

Methyl Chavicol—Synthesis.—Tiffeneau has succeeded in synthesizing methyl chavicol by the action of C_3H_5Br on the bromide of *p*-anisyle. Thus obtained, it boils at 215–216° C., and has the sp. g. 0.9755. It is converted into anethol, m. p. 22° C., by the action of alcoholic potash.—Comp. rend., *139*, 482.

Coal Tar—New Constituents.—Prof. F. B. Ahrens has determined in the fractions of coal-tar distillation, passing before the benzol, two hitherto unobserved gaseous constituents, named *butylene* and *amylene*, together with a sulphurated liquid, resembling and possibly identical with carbon disulphide. Of basic bodies, he determined the presence of *α β-dimethylpyridin*, consequently the last of the six isomeres, and also *γ-methylpyridin*, a body hitherto only obtained symthetically and with difficulty.—Pharm. Ztg., *49*, No. 78, (Sept. 28, 1904), 827.

Eucalyptol—A Derivative of American Oil of Turpentine.—Dr. L. Reuter while experimenting with the mother liquors resulting in the manufacture of terpin hydrate from American oil of turpentine, for the purpose

of finding a better outlet for their by-product than the manufacture of varnishes, made the interesting discovery that these mother liquors contained from 5 per cent. and sometimes even as much as 9 per cent. of Eucalyptol. This eucalyptol was found to be chemically and physiologically identical with the natural eucalyptol from eucalyptus oils, and it is therefore only a question of time when it will be made from oil of turpentine exclusively. Inasmuch as any cheaper grade of oil of turpentine can be used for making eucalyptol, the author considers the most favorable locality for its manufacture to be the pine districts of the Southern States. The industry would naturally be combined with the production of other derivitives of turpentine oil besides eucalyptol and terpin hydrate, such as turpineol and synthetic camphor.—Midland Drugg., Jan. 1905, 422; from Sci. Am.

Geraniol, Cyclogeraniol and Nerol—Physiological Action.—According to Hildebrandt, both nerol and geraniol are toxic when administered subcutaneously to mice, causing death in doses of 5 Cgm. Cyclogeraniol produces no effect in this quantity, 20 Cgm. being necessary to produce torpidity in the animals. Geraniol gives rise to an acid, $C_{10}H_{14}O_4$, in the urine of the animals treated with it; but neither cyclogeraniol nor nerol gives rise to the formation of the acid in the body.—Pharm. Journ., Dec. 10, 1904, 854; from Nouv. Remèdes, 1904, *20*, 465.

Nerol—Characters.—H. von Soden and W. Treff state that pure nerol, from geraniol, has a purer rose odor than the other alcohols obtained from neroli or petit-grain oil. Its specific gravity is 0.8813; it is optically inactive; boils at 226°–227° C. at 755 Mm., and at 125° C. at 25 Mm. It combines with four atoms of bromine. The diphenyl-urethane crystallizes from alcohol in long glittering needles, which melt at 52–53° C. The higher melting-point given by Hesse and Zeitschel, 73–75° C., is due to the nerol they employed being contaminated with geraniol. Geranyl diphenyl-urethane melts at 82° C. Nerol has the formula, $C_{10}H_{18}O$.—Pharm. Journ., Dec. 3, 1904, 813; from Chem. Zeit., *27*, 897.

Paraffin—Use for the Removal of Fixed Oils from Vegetable Extracts.—Referring to the suggestion of Gordon that paraffin be used instead of ether for removing the resinous and odorous matter from opium infusion in the preparation of the deodorized tincture (see Proceedings, 1901, 606), J. J. Barnett suggests the extension of this use to removal of oil from other vegetable extractions, such as extract of nux vomica, extract of stramonium seed, etc. The firm consistency of paraffin, its light specific gravity, its insolubility in water, its high congealing point, and the non-effect of acids upon it, coupled with its power to remove fats, fixed oils, and resinous matters, would seem to make it an ideal substance, and particularly so in contrast with the much more expensive and highly volatile ether, or even with the equally cheap petroleum benzin. The author is not prepared to give any experimental data, but considers the availability for the purpose named

sufficiently evident to warrant experiments in this direction.—Proc. Md. Pharm. Assoc., 1904. 73.

Pinene Isonitrosocyanide—Derivatives.—Experiments recorded by W. A. Tilden and H. Burrows show pinene isonitrosocyanide to be a nitrite from which, by the action of strong sulphuric acid, an amide of corresponding constitution,

Pinene Isonitrosocarboxylamide ($C_{10}H_{15}(:NOH).CO.NH_2$), has been obtained. This forms prisms which melt at 220° C., and yields a methyl ether, which forms large, colorless prisms melting at 145° C., and a benzoyl derivative melting at 197° C. Pinene isonitrosocarboxylic acid, corresponding with the amide, has not been obtained, but hydrolysis with hydrochloric acid yields an oily acid volatile in steam, which is probably the ketonic acid, $O:C_{10}H_{15}.CO_2H$. By the continued action of sulphuric acid on the amide an isomeric change is induced, the product having the properties of the lactam, in which the oxime group, C:N.OH, has been converted into a carbonyl group, while an imino group enters into the ring thus, —CO.NH—. From this compound, by boiling with caustic potash, the corresponding acid has been obtained. The amide crystallizes in prisms, which melt at 209° C., and contain one molecule of water of crystallization. The acid also contains water of crystallization, and melts at 220° C. The silver and other salts of this acid have been prepared and analyzed. When heated with hydrochloric acid the acid is converted into an amino acid, which forms a stable, crystalline hydrochloride. In the formation of this compound it is believed that the ring is opened and, by the assumption of the elements of water, the group —CO.NH— is converted into —CO_2H and NH_2—.—Pharm. Journ., April 8, 1905, 513; from Proc. Chem. Soc., *21* (1905), 91.

Primula Camphor—Characters, Etc.—H. Brunner contributes some further information concerning the characters of the so-called primula camphor from the roots of *Primula veris*, L. By steam distillation 500 kilos of roots yielded 170 grams crude camphor. The rectified product boiled at 255° C., and had the specific gravity 1,2155; its melting point lay at 49° C. Contrary to Mutschler's statements, its formula is $C_9H_{10}O_4$. On saponification, the body yielded no salicylic acid, as Mutschler stated, but the m-methoxysalicylic acid melting at 140° which, like the camphor itself, shows an intense blue-violet coloration with ferric chloride. The molecule of this body contains two methoxyl-groups. It follows from these results that primula camphor is the methyl ester of m-methoxysalicylic acid. As a matter of fact, the ester produced synthetically by Brunner for comparison, proved identic in all its properties with the natural product.—Schimmel's Rep. April–May, 1905, 67; from Schweiz. Wchschr. f. Chem. u. Pharm. *42* (1904) 305.

Pulegone Nitrosite—Method of Preparation.—P. Genvresse obtains pule-

gone nitrosite, $C_{18}H_{16}.N_2O_3$, in the form of colorless silky needles, melting at 68–69° C. Its chloroformic solution is dextrogyre + 23° 13′ at 23° C. It is distilled with difficulty with steam. With nascent hydrogen it yields ammonia and an oily liquid; its oxime is uncrystallisable. It may be obtained from pulegone either by the action of nitrogen peroxide or of the nitrous fumes evolved from nitric acid and starch. Pulegone is dissolved in petroleum ether, and the solution, cooled by means of ice, is saturated with nitrogen peroxide or nitrous vapors, when, on standing, a heavy oil separates. This is distilled with water, and the heavy non-volatile residue is set aside for several days, when the nitrosite crystallises out. The crystalline mass is drained and recrystallised from alcohol.—Pharm. Journ., Dec. 24, 1904, 929; from Comptes rend., 137, 494.

Terpin Hydrate—Solubility.—Prof. Francis Hemm, in the course of experiments on getting a mixture of terpin hydrate in a syrupy solution, determined its solubility to be: 1 part in 10 parts of alcohol, or in 250 parts of water, at 15° C.—Meyer Bros.' Drugg., July, 1904, 191.

Umbelliferone Test—Modification.—F. H. Alcock observes that the usual method of applying the umbelliferone test (for instance, for the detection of galbanum in ammoniae) is to heat the sample with strong hydrochloric acid for a few minutes, then diluting with several times its volume of water, filtering, and adding to the filtrate excess of ammonium hydrate when the blue fluorescence (characteristic of umbelliferone) is observed. He finds that under this test the copious fumes evolved during the boiling are very annoying, unless the boiling is conducted in a fume chamber, but may be obviated if the strong acid is diluted with an equal volume of water, and then gently boiling the sample in the mixture. The test is then carried out quite as successfully as when strong acid is used undiluted. For 3 Gm. of the sample about 15 Cc. of acid and 15 Cc. of water are sufficient.—Pharm. Journ., July 26, 1904, 112.

Volatile Oils—Formation and Distribution in Annual Plants.—E. Charabot and G. Lalour have made observations on the amount and distribution of essential oils in annuals at four stages; the first, before flowering, when the leaves were in preponderance; the second, at the commencement of blooming; the third, when the plants were in full bloom; and the fourth, after flowering, when the seeds were ripening. It is found that as the process of inflorescence proceeds, the amount of essential oil increases in the flowering parts and decreases in the leaves, reaching a maximum, in the first, when the plants are in full flower, with a corresponding minimum in the second. After flowering, however, the reverse takes place; the amount of essential oil found in the leaves again shows an increase, while that in the flowering organs diminishes. In other words, the movement of the essential oil follows that of the reserve material in the fecundated flower; and after fertilization is accomplished

the odorous principles are transferred back to the chlorophyll-containing organs of the plants. The root of annuals is found to contain no essential oil and the stem but little. The leaves and inflorescences contain the greater part.—Pharm. Journ., Febr. 11, 1905, 193; from Compt. rend., *139* (1904), 928.

Odorous Principles of Plants—Distribution and Circulation.—In continuation of their researches on the circulation of the odorous principles in plants (see Proceedings, 1904, 840), Carabot and Hebert find that after its formation in the green organs, chiefly the leaf, the essential oil is partly dissolved by the water which circulates in the plant. The chemical transformations which the terpene compounds undergo are such that the essential oil contained in the stem becomes less soluble than that contained in the leaf. The deduction is drawn, that a portion of the odorous compounds migrates from the leaf towards the stem under the influence of the laws of diffusion. An examination of orange flowers and buds at different stages of growth leads the authors to think that the petals of the plant contain the greater portion of the essential oil of the flower, and contain also the greatest percentage proportion of oil. During the development of the flower, the essential oil becomes richer in esters of terpene alcohols, in methyl anthranilate, and in total alcohol. The ratio of the quality of combined alcohol to that of total alcohol increases; in other words, esterification is continued in the flower, but at a slow rate. The proportion of geraniol increases, and that of linalool decreases, so that the alcoholic mixture becomes richer in geraniol.—Pharm. Journ., Aug. 6, 1904, 178; from Bulletin of Rouse-Bertrand Fils, I., 9, 13.

Flower Oils—Extraction by Volatile Solvents.—Schimmel & Co. (Report, Oct.–Nov., 1904, 40–42) communicate the results obtained by H. v. Soden and others in extracting the odorous principles of flowers by volatile solvents. They observe that it is well known that in the blossom industry of the South of France the odor of many blossoms which are important for purposes of perfumery has now for some years been obtained on an extensive scale by extraction with light petroleum. The products of this manufacturing process, the

Blossom Extracts, are distinguished by their natural aroma, but in addition to the essential oils, which alone come under consideration for the odor, they contain large quantities of odorless constituents, such as vegetable waxes, resins, paraffins, etc., of which many dissolve only with difficulty in alcohol. This odorless ballast can partly be removed from the extracts by treatment with alcohol, or more completely by distillation with water-vapor. In view of the comparatively small quantity of essential oil contained in the extracts, a large proportion of the oil passes over in the distillation water, from which it is recovered by extraction with salt and with ether. The pure essential oils of the blossoms which remain behind

after distilling off the ether contain the odorous substances of the blossoms in a concentrated form, and they have for several years occupied in a marked degree the attention of the chemists whose work lies in the domain of the essential oils. The following are described, the season of collection, yield and constants being given: *Violet-*, *Mignonette-*, *Orange-*, *French Rose-*, *German Rose-*, *Jasmin-* and *Cassie-blossoms*.

New Algerian Oils—Characters and Constants.—P. Jeancard and C. Satie describe two new essential oils which they designate respectively as "Essence de Gouft" and Essence de Sheih." The

Gouft Oil is bright yellow, has an odor reminding of turpentine and mastic, $d_{9.5°}$, 0.8720; a_D — 15° 20′; acid number, 1.12; ester number, 14; ester number after acetylation, 42. The boiling-point lay about 170° C.; the portions boiling below 170° appeared to contain pinene; melting-point of the nitrosochloride, 103° C. The higher boiling portion probably contains geramol.

Sheih Oil has a brown-red color and an odor like absinthe; $d_{9.5°}$, 0.9540; acid number, 8.4; ester number, 66.5; ester number after acetylation, 129.5. It contained about 15 per cent. of phenols, together with thujone and thujol.—Schimmel's Rep., Oct.–Nov., 1904, 48.

Artemisia Oils—Examination of Several New Kinds.—Frank Rabak has distilled the volatile oils from three species of *Artemisia* collected in South Dakota, which have been identified by Dr. R. H. Denniston to be *A. frigida*, Willd., *A. leudoviciana*, Nutt, and *A. caudata*, Michx., respectively.

Oil of Artemisia was obtained to the amount of 0.41 per cent. from the fresh herb. It was light greenish and had a pleasant odor suggestive of cineol. From the dried herb distilled subsequently only 0.07 per cent. of oil was obtained, but an additional quantity was obtained from the aqueous portion of the distillate by shaking out with petroleum ether. Both of these oils were much darker in color than the oil from the fresh herb, and their optical rotation could therefore not be determined. That of the oil from the fresh herb was a_D = —24°49′; the other constants of the three oils were as follows:

	Sp. Gr. at 22°	Acid Number.	Ester Number.
Oil from fresh herb	0.927	1.2	31.8
Oil from dried herb direct....	0.930	4.7	40.
Oil from aqueous distillate ...	0.916	5.3	25.

It is presumed that these oils contained cineol.

Oil of Artemisia leudoviciana was obtained from the fresh herb to the amount of 0.38 per cent. It was greenish-yellow and possessed a strongly aromatic odor similar in some respects to that of the oil of *A. frigida*.

Oil of Artemisia caudata was of a yellow color, possessed a very sweet-

ish odor, and was obtained from the fresh herb to the amount of 0.24 per cent. The constants of these two oils are given as follows:

	Sp. Gr. at 22°	a_D 100Mm. Tube.	Acid Number.	Ester Number.
Oil of *A. leudoviciana*	0.929	10° 14′	4	10
Oil of *A. caudata*....	0.920	12° 30′	0	17

The sweetish odor of the oil *A. caudata* suggests the presence of methylchavicol or its isomer anethol or both.—Pharm. Rev., April, 1905, 128–129.

Oil of Artemisia Annua, L.—*Characters and Constants.*—The oil obtained by distillation in a yield of 0.29 per cent. from the green herb of *Artemisia annua* L., cultivated by Schimmel & Co., had a lemon-yellow color and a pleasant, refreshing odor, reminding distantly of sweet basil. The specific gravity was 0.8912 at 15°, the optical rotation a_D — 1° 18′; acid number 3.8; ester number 19.2; ester number after acetylization 44.5; the oil dissolved in 1 to 1.5 vol. 80 per cent. alcohol, but when more alcohol was added opalescence or cloudiness occurred owing to a large separation of paraffin.—Schimmel's Rep., April–May, 1905, 85.

Oil of Artemisia Herba Alba—Characters and Constituents.—Emilien Grimal obtained by steam distillation from the fresh non-flowering herb of *Artemisia herba alba* Asso., a plant widely distributed in Algeria and much in favor as a remedy, a yellow-greenish oil with a most agreeable odor. 150 kilos herb yielded 450 Gm. oil, *i. e.* about 0.3 per cent. The oil which he examined further in our laboratory, had the following constants: $d_{15°}$ 0.9456; $n_{D20°}$ 1,47274; $(a)_{D20°}$ — 15° 38′; acid number 6.46; ester number 89.23; ester-content 31.15 per cent., calculated for $CH_3COOC_{10}H_{17}$, corresponding to 24.48 per cent. alcohol $C_{10}H_{18}O$; ester number after acetylization 135.38, from which, after deduction of the alcohol present as ester in the original oil, a content of 12.65 per cent. free alcohol is calculated. The oil readily dissolves in 2 to 2.5 parts 70 per cent. alcohol. When cooled to — 12° C., it did not solidify. On distillation *in vacuo*, fractions were obtained in which l-camphene, cineol and camphor could be detected. The higher boiling portions, when treated with phthalic acid anhydride (according to Haller's method), yielded a small quantity of an alcohol which has not yet been examined further. From the saponification liquor of the oil, after adding sulphuric acid, a fatty acid mixture was separated, which, according to the analysis of the silver salt, contained caprinic or caprylic acid.—Schimmel's Rep., Oct.–Nov., 1904, 13; from Bull. Soc. Chim. (3), *32* (1904) 694.

Bermuda Bay-Berry Oil—Characters and Constants.—Schimmel & Co. describe an oil, distilled by them from bay-berries from the Bermuda Islands, as follows: The yellow-brown oil has an aromatic odor which, however, clearly differs from that of the ordinary bay oil. The yield of oil amounted to 3.66 per cent.; $d_{15°}$ 1.0170; a_D — 7° 3′; phenol-content

73 per cent.; soluble in 1.5 vol. 70 per cent. alcohol, cloudiness when more than about 4 volumes were added; soluble in 0.5 and more vol. 80 per cent. alcohol. The phenols consist of eugenol (melting-point of the benzoyl compound about 70° C.). The non-phenols contain abundant quantities of l-phellandrene (melting-point of the nitrite recrystallized from acetic ether 103° to 104° C.); myrcene, however, does not appear to be present in the oil.—Schimmel's Rep., April–May, 1905, 85.

Volatile Oil of Burdock—Yield, Properties, etc.—According to Heinrich Haensel's report for the second quarter of 1904, burdock root yields 0.176 per cent. of a brownish-yellow volatile oil with an acid reaction; sp. gr. 0.9695 at 25° C.; $a_D + 1.24°$ at 30°; acid value, 13.5; saponification value, 236.8. It is soluble in alcohol (80 per cent.). It contains a fatty acid, as has been mentioned in a previous report, which has now been determined to have the melting-point 62° C., and identified as being palmitic acid.—Apoth. Ztg., *19*, No. 58 (July 20, 1904), 557.

Cajuput Oil—Cause of Green Color.—It is a well-known fact that the peculiar green color of cajuput oil, due to the presence of small quantities of copper, cannot be removed by shaking with water. H. C. Prinsen-Geerlings believes that this behavior must be attributed to the fact that cajuput oil contains small quantities of butyric and valeric acids, free and esterified, and that these retain the copper in solution. The author comes to this conclusion on the strength of the following observations: if different samples of cajuput oil, freed from acids and esters, to which have been added water and ethyl formiate, or acetate, propionate, butyrate, valerianate, oxalate, etc., are submitted to the action of copper turnings, only those mixed with butyrate and valerianate acquire a green color retained by the oil, whilst in all other cases the color passes over into the water. Oil of valerian, in which butyric and valeric acids have been detected, when brought in contact with copper turnings, also acquires a green color which cannot be abstracted with water.—Schimmel's Rep., April–May, 1905, 12; from Pharm. Weekbl., *41* (1904), 1081.

French Oil of Camphor Leaves—Distinctive Characters.—Schimmel & Co. describe an oil, obtained from the leaves of a camphor tree (*Laurus camphora*, L.) growing at Cannes, as in so far interesting that it has a pronounced cardamom-like odor, and, as was shown by the examination, is also closely allied in its composition to the cardamom oils. The oil has little resemblance to previously-examined distillates from the leaves of *Laurus camphora*, L. It is an open question to what cause these differences must be attributed. The oil, obtained in a yield of about 0.52 per cent., was colorless and behaved as follows: $d_{15°}$, 0.9058; a_D, —26° 12′; acid, number, 0.34; ester number, 8.82; ester number after acetylation, 46.9; soluble in 1 and more volumes 80 per cent. alcohol. The oil boils at 4 Mm. between 35° and 95° C. In the lowest boiling portions we de-

tected pinene (melting-point of the nitrolbenzylamine 123° C.); the presence of camphene is probable, but it could not be proved with certainty (by conversion into isoborneol). The oil further contains large quantities of cineol (melting-point of the iodol-compound 112° C.). From the oil-portions passing over above 76° at 4 Mm., a principal fraction boiling between 85° and 86° (5 Mm.) was obtained, representing about 10 per cent. of the oil employed, which consisted of l-terpineol (a_D —58° 23′), more closely identified by its phenyl-urethane (m. p. 112°). This terpineol had the melting-point 35° C.—Schimmel's Rep., April–May, 1905, 83.

Cananga Oil, Java—Adulterants.—Schimmel & Co. have observed adulterations of cananga oils with cocoa butter and with resin. The first-named adulteration was so coarse (50 per cent.), that at ordinary temperature the bulk of the oil was already solid, whilst pure oil remains liquid even in a freezing-mixture; moreover, the following properties were determined: $d_{15°}$ 0.9256; a_D —3°50′; saponification number, 200.4. If these figures are compared with those of the constants of pure cananga oil $d_{15°}$ 0.91 to 0.95; a_D —17°—55°; saponification, 10 to 36), the adulteration becomes at once apparent. The cocoa butter isolated from the oil was identified by its melting-point (28°) and saponification number (232), and also by the melting-point of its fatty acids (24° to 25°). The second oil showed the following behavior: $d_{15°}$ 0.9716; a_D —11°40′; saponification number, 43.11. Owing to these properties the oil was also suspicious, and for this reason was, for the purpose of further examination, submitted to steam distillation, when only about 75 per cent. oil passed over, and a brown, fairly brittle resin remained behind. As pure oil, submitted to the same operation, only leaves behind a distillation residue of about 5 per cent., the above result showed that about 20 per cent. resin had been added to the oil.—Schimmel's Rep., April–May, 1905, 19.

Volatile Oil of Wild Cinnamon—Characters.—E. Goulding has distilled the so-called "wild cinnamon bark" (which see under "Materia Medica), and obtained a volatile oil, which was found to contain 15 to 20 per cent. of a terpene, sp. gr. 0.8659 at 15° C.; linalool, safrol, 40 to 50 per cent.; eugenol, 1 per cent., and probably 3 per cent. eugenol methyl ether. Of the alcohols there were about 30 per cent., and of esters, 1.5 per cent. As a source of safrol and linalool it might, therefore, be of value if ob tainable cheaply and in quantity.—Pharm. Journ., Dec. 17, 1904, 892.

Citronella Oil—Precaution against Adulteration.—The Government of Ceylon now appears to be prepared to take energetic measures for counteracting the decline—due to excess in adulteration— of the citronella oil industry. A communication from the Government shows, that the intention is to accept the proposal made by J. C. Willis, Director of the Royal Botanical Garden at Peradeniya, according to which the citronella oils for export are to be subject to strict supervision. For this purpose, samples are taken from each oil drum, previous to shipment, by specially appointed

inspectors in the presence of a representative of the export firm, and these samples tested immediately according to Bamber's method. A certificate of the result of the examination is handed to the firm, and the drums are officially sealed. The oils which according to Bamber's test do not contain more than 1 per cent. of adulterations are sealed with a red seal which, in addition to the Government brand, carries the remark "*pure oil*", whilst oils which are found to be adulterated up to 10 per cent., are marked with a green seal with words "*90 per cent. purity.*" The export of all oils adulterated to a greater extent is prohibited.—Schimmel's Rep., Oct.–Nov., 1904, 19.

Citronella Oil—Method of Detecting and Estimating Adulterants.—The determination of certain adulterants in citronella oil is conveniently effected, according to "D. Mechan. Ztg.," by the aid of a mixing cylinder, constructed as shown in the cut (Fig. 46). Two cubic centimeters of pure coconut oil, free from acidity, and 2 cubic centimeters of the citronella oil are introduced into the cylinder with 20 Cc. of 93 vol. per cent. alcohol at 30° C.; the mixture is shaken for one minute and centrifuged for another and the increase in the volume of the coconut oil, if any, noted on the scale, which is divided in the constricted lower portion of the cylinder into $\frac{1}{10}$ Cc. From the increase in volume the amount of adulterant is then readily calculated. —Pharm. Ztg., *49*, No. 56 (July 13, 1904), 588.

FIG. 46.

Oil of Cloves—Estimation of Eugenol by Means of the Refractive Index.—W. H. Simmons observes that the utility of the refractive index in the examination of essential oils has been subject to much criticism, but there can be little doubt that with many oils the figure is a very useful one, and this particularly appears to be the case with clove oil. The principal constituent of this oil is, of course, eugenol, which has a relatively high refractive index, viz., n_D 20° = 1.5412, and the author found, from the examination of several samples of the oil, that with pure oils the refractive index is approximately proportional to the eugenol content, so that—in view of the rapidity with which the determination can be made—it should be of much value to distillers of clove oil, who now usually take the specific gravity and phenol content of their finished products. With samples whose genuineness cannot be guaranteed, however, it is not safe to base an opinion on the refractive index only, as is shown by No. 9 in the accompanying table, which is evidently grossly adulterated, judged by the high specific gravity compared with its low proportion of eugenol, though from its refractive index it might be expected to contain about 86 to 88 per cent. of phenols.

No.	Specific gravity, 15°/15°	Rotation, $[a]_D$.	Refractive index, n_D 20°.	Phenols, per cent.
1.	1.0606	—	1.5382	93
2.	1.0509	—0° 44′	1.5318	88
3.	1.0506	—0° 53′	1.5304	86
4.	1.0475	—1° 0′	1.5304	86
5.	1.0455	—0° 23′	1.5297	85.5
6.	1.0560	—0° 35′	1.5340	92
7.	1.0549	—0° 40′	1.5340	91.5
8.	1.0507	—0° 54′	1.5336	87
9.	1.0617	—0° 20′	1.5327	82

—Chem. News, Sept. 16, 1904, 146.

Volatile Oils of Conium—Yield from Herb and Fruit, Etc.—According to Heinrich Haensel's Report (second quarter, 1904), conium herb, without flowers, yields 0.0765 to 0.0783 per cent. of dark-brown, unpleasant-smelling oil, with an acid reaction; sp. gr. at 15° C., 0.9502; acid value about 60; saponification value about 70. It deposits a solid stearoptene at low temperatures. When rectified with steam, only about 25 per cent. distils; the blackish residue solidifies on cooling. The rectified oil is brownish, acid in reaction, and has nearly the same odor as the crude product. Its sp. gr. at 20° C. is 0.9310; it dissolves readily in alcohol (90 per cent.), and in about 70 parts of alcohol (80 per cent.). It contains free palmitic acid. The

Volatile Oil of Conium Fruits was obtained only to the amount of 0.0179 per cent., in form of a blackish-brown, evil-smelling oil of neutral reaction. Sp. gr. at 15° C., 0.8949; saponification value, 34. On rectifying with steam, 51 per cent. distils over as a greenish-yellow oil; sp. gr. at 15° C., 0.8313; a_D — 2.16°; readily soluble in 96 per cent. alcohol, but with difficulty in 80 per cent. alcohol.—Apoth. Ztg., *19*, No. 58 (July 20, 1904), 557.

Cypress Oils—Characters and Constants of Different Kinds.—Schimmel & Co. have previously mentioned that there are important differences between the properties of cypress oils distilled in the south of France and their own distillates, due doubtless to the fact that in France the fresh leaves and young branches (of *Cupressus sempervirens*, L.) are used, whilst this material during the lengthy transport dries up somewhat, and thereby becomes poorer in highly volatile constituents. Up to the present time the following differences and constants have been observed in the comparatively small number of oils examined:

1. Cypress Oil distilled in the south of France: $d_{15°}$ 0.868 to 0.878; a_D + 22° to + 31°; acid number 0; ester number 5 to 10; ester number after acetylation 10 to 15; soluble in 5 to 6 and more volumes 90 per cent. alcohol.

2. Cypress Oil distilled by Schimmel & Co.: $d_{15°}$ 0.88 to 0.892; a_D + 4° to + 18°; acid number 1.5 to 3.0; ester number 15 to 22; ester number

after acetylation 43 to 49 ; soluble in 2 to 6 and more volumes 90 per cent. alcohol.

Recently also an *oil distilled from the Cupressus sempervirens*, L., was received from the south of France, which is particularly interesting inasmuch as it completely resembles the ordinary French distillate : $d_{15°}$ 0.8686 ; $a_D + 30° 48'$; acid number 0 ; ester number 6.74 ; ester number after acetylation 11.78 ; soluble in 6 or more vol. 90 per cent. alcohol. Further, a sample of cypress oil from the south of France, the

Oil of the Leaves of Cupressus Lamtertiana—a tree often found in the gardens of the Riviera, was found to differ essentially from ordinary cypress oil. It was yellowish-green and had an odor of a melissa character which is probably due to the presence of citronellal. When extracted with sodium bisulphite, aldehydic constituents could actually be detected, but their quantity was too small to identify them ; the odor pointed to citronellal or a fatty aldehyde. The non-aldehydic portions had a pepper-like odor, and may possibly contain cymene. The other properties of the oil were the following : $d_{15°}$ 0.8656 ; $a_D + 31° 53'$; acid number 1.5 ; ester number 13.9 ; ester number after acetylation 50.82 ; forms a cloudy solution with 9 to 10 volumes 80 per cent. alcohol, and a clear solution with 0.5 per cent. and more volumes 90 per cent. alcohol. The yield of oil was about 0.1 per cent.—Schimmel's Rep., April–May, 1905, 26 and 83.

Oil of Erigeron Canadense—Difference in Yield and Characters from Fresh and Dry Herb.—Frank Rabak communicates some interesting results obtained with distillates from the fresh and the dry herb of *Erigeron canadense* collected in South Dakota, where the plant is locally known by the name of "fireweed." From the fresh herb 0.66 per cent. of the light yellow oil was obtained by distillation, possessing a peculiar odor, suggestive of caraway. A crystalline deposit was also noticed around the mouth of the condenser, and like crystals were obtainable from the oil, but these do not appear to have been further studied. From a larger quantity of the herb, which had been dried and shipped to Madison, the oil was also distilled, but the yield here was only 0.26 per cent. Moreover, this second oil was darker, being light brown, but had a strongly aromatic odor, much the same as that obtained from the fresh herb, and this also deposited a small amount of crystals. The results of the physical and chemical experiments are shown in the following table :

	Oil from Fresh Herb.	Oil from Dried Herb.
Sp. gr. at 22° C.	0.8614	0.8610
a^D in 100 mm. tube	+67°16′	+76°37′
Acid number	0	0
Ester number	108	52
Saponification number	108	52
Acetylation number (saponification after acetylation)	108	86
Aldehyde content	0.77% (calculated as citronellal, $C_{10}H_{18}O$)	0.44% (calculated as citronellal, $C_{10}H_{18}O$)

The change in angle of rotation would seem to indicate that the increase is due to the decomposition of some of the non-limonene constituents of the oil. This is substantiated by the diminution of the ester number. The saponification number after acetylation would indicate that the erpineol (10.9 per cent. by calculation) is a decomposition product although this does not preclude the original presence of a substance of alcoholic nature.—Pharm. Review, March, 1905, 81–83.

Australian Eucalyptus Oils.—Comprehensive Tabulated Description.—Having been supplied by the curators of the Technological Museum of Sydney, N. S. W., (Messrs. Baker and Smith) with a collection of Australian eucalyptus oils, which in their richness testify to the zeal and success with which the study of this extremely varied family of plants is carried on in Australia, Messrs. Schimmel & Co., in their report for October–November, 1904 (p. 32–37) reprint the information accompanying the specimens in the form of a carefully arranged table, exhibiting the name of the plant—botanical and vernacular—the locality, the average yield of oil, and the principal chemical constituents of the oil. The importance of this tabulated exhibit will become manifest when it is mentioned that no less than 108 different oils, from as many species of *Eucalyptus*, are thus described.

Eucalyptus Oils—Distinction of the Therapeutically Valuable from the Less Valuable Sorts.—Dr. G. Weigel defines the important characters whereby the therapeutically valuable oil of *Eucalyptus globulus* may be distinguished from the undesirable oi lof *Eucalyptus amygdalina*. The eucalyptus globulus oil is always dextro-rotatory, has a specific gravity of 0.910–0.913, and is soluble in diluted alcohol (Pharm. Germ., iv, Rep.), while the eucalyptus amygdalina oil is characterized by its low specific gravity—from 0.850 to 0.890—its strongly lævogyre rotation (about —10° to —70°C.), its insolubility in diluted alcohol, and by yielding a precipitate of phellandrene nitrite when treated with sodium nitrite and acetic acid. The demand, however, that the eucalyptus globulus oil shall form a clear solution with 3 parts of diluted alcohol, is not uniformly applicable to the

commercial oil, since samples of good oil, having in all other respects the properties of eucalyptus globulus oil which required 4 parts, and in some instances up to 10 parts of diluted alcohol for solution have been met by the author.—Pharm. Centralh., *45*, No. 29 (July 21, 1904), 555.

Oil of Eucalyptus—Experimental Distillations in California.—R. C. Jackson, in order to make a comparative study of the oils obtained from different species of *Eucalyptus*, grown in California, made distillates from the following: *Eucalyptus oleosa* (first and second year's growths) and *Eucalyptus globulus* (first and second year's growths). The leaves were collected in January from the Sutro forest. Using a copper still, which formerly had been used for distilling oil of rose in Kizanlik, Bulgaria, five distillates were made: two from the official leaves, one from the *E. oleosa*, one from the younger leaves of the *E. globulus* and one from the younger leaves of the *E. oleosa*. The second year's growth of the *oleosa* contained the largest amount of oil, the official *globulus* (second year's growth) was next in order, the *oleosa* of the first year's growth was third, while the first year's growth of the *globulus* gave the lowest yield, and the oil was contaminated with a greenish flocculent precipitate with a decided camphoraceous odor. The oil from each one contained a resinous constituent, which was removed by filtering through charcoal. The precipitate was then treated with alcohol, and again filtered to remove the charcoal. The filtrate containing the soluble matter was evaporated and the residue proved to be resinous by burning. It gave a dense, yellow flame with a great amount of smoke and left only a slight ash. The different oils were then tested for phellandrene by the addition of 4 Cc. of glacial acetic acid and 2 Cc. of a saturated aqueous solution of sodium nitrite to 2 Cc. of the oil. Only a few very small crystals were formed in the oil from the *E. oleosa*, the other varieties yielding none. The Smithson Development Company, of San Rafael, Cal., has placed on the market a nearly colorless oil of eucalyptus, responding favorably to all of the tests of the U. S. P. This company handles about 8 tons of eucalyptus leaves daily, which are distilled with steam under pressure. Its chief industry is the manufacture of a boiler compound, said to prevent scales in boilers, the oil of eucalyptus being obtained as a by-product.—Amer. Drugg., June 12, 1905, 317.

Eucalyptus Oil—Adulteration with Castor Oil.—C. T. Bennett directs attention to eucalyptus oil adulterated with castor oil. The general character of the samples answered the description of the B. P., the only noticeable effect of adulteration being a slightly increased viscosity, and the application of pharmacopœial tests revealed nothing; but when an estimation of the cineol content was made, the results were lower than was consistent with the specific gravity. The following were the general characters of these adulterated oils: Specific gravity, 0.917 to 0.919; optical rotation, 0° to + 2°; cineol content, 38 to 45 per cent. One sample contained nearly 20 per cent. of the adulterant, while others from

the same source contained 12 to 15 per cent. Unless specially tested for, an admixture of 5 to 10 per cent. of castor oil might be overlooked. —Chem. & Drugg., Jan 7. 1905, 33.

Oil of Eucalyptus Polybractea—Physical and Chemical Characters.— John C. Umney and C. T. Bennett have examined a specimen of the volatile oil of *Eucalyptus polybractea*, and determined the following physical and chemical characters of the sample :

Specific gravity	0.929
Optical rotation in tube of 100 Mm.	nil.
Eucalyptol percentage as determined by Scammell's process	79 to 80

It is worthy of note that the oil was absolutely free from any irritating odor, due to the absence of aldehydes, and, as indicated by specific gravity, optical inactivity and fractional distillation, very rich in eucalyptol —78 per cent. distilling between 173-176° C.—Pharm. Journ. Feb. 4, 1905, 143.

Oil of Fennel—Abnormally High Specific Gravity due to Exposure to Light and Air.—A question as to the cause of the high specific gravity of fennel oil sometimes observed, is answered by Schimmel & Co., to the effect, that when fennel oil (or anise oil), is kept in an unsuitable manner, that is to say when light and air are admitted, a gradual increase in the specific gravity is observed which may finally bring the latter above 1. This increase in the weight is due to oxidation-processes, or occurences of polymerisation, as the anethol present in the fennel oil in the presence of light and air partly oxidises into anisic aldehyde and anisic acid, and partly becomes polymerised. The products in question now not only cause an increase in the specific gravity, but also at the same time a greater solubility of the oil. Moreover, the solidifying point is naturally greatly influenced, and finally such oils no longer solidify at all. While normal fennel oil has the sp. gr. at 15°C. of 0.965–0.975, a solidifying point + 3° to + 7°, sometimes over + 8°, and was soluble in 6 to 8 vol. and more of 80 per cent. alcohol, an oil changed in the manner described showed a sp. gr. of 1.00053 at 15°C., a solidifying point —8°, and solubility in 3 vol. and more of 80 per cent. alcohol. These differences become still more pronounced in the case of

Pure Anethol.— An anethol which had been exposed for 2 years to the influence of light and air, and originally had the sp. gr. 0.9846 (at 25°C.), solidifying point + 21° 3′, and was soluble in 2 or more vols., 90 per cent. alcohol, now had the density 1.1245, failed to solidify at —20°C., and was soluble in 1.5 to 2 and more volumes of 70 per cent. alcohol. The changed anethol had a yellow color and was less mobile than normal anethol ; the taste was no longer like anise, but disagreeable and bitter. By treatment with bisulphite, anisic aldehyde could be isolated, but only

traces of anisic acid could be detected. The bulk of the anethol had become polymerised.—Schimmel's Rep., Oct.–Nov. 1904, 42.

Siberian Fir Oil—Characters and Constants.—J. Schindelmeyer, having previously directed attention to the possible utility of the volatile oil of Siberian fir for the synthetic preparation of camphor, on account of its high *l*-borneol acetate content, supplements his former paper by communicating the following constants for the pure oil: $[\alpha]_D$ at 17° C. not under —39° 40′; specific gravity at 17° C. not under 0.918. Ester value 35–42 per cent. as bornyl acetate. Examination of commercial samples showed them to range in specific gravity from 0.911 to 0.915 at 17° C.; $[\alpha]_D$ — 29° 18′ to 34° 30′; they gave from 22 to 30 per cent. of a fraction boiling between 170°–190° C., and in the higher boiling fraction 22–30 per cent. of bornyl acetate. The rotation of the 170–190° C. fraction was not over —34° at 17° C. From this fraction a portion boiling between 174°–180° C. was isolated, having the low rotation — 18° 28′ at 17° C. It is evident, therefore, that the commercial samples are adulterated with the cheaper pine needle oil or oil of turpentine. The ester content of pure Siberian fir oil never falls below the equivalent of 35 per cent. of bornyl acetate.—Apoth. Ztg., *19*, No. 82 (Oct. 12, 1904), 815.

Geranium Oil—Production in Réunion.—Schimmel & Co. mention that although the geranium plantations in Réunion were totally destroyed on the 21st and 22nd March of this year (1904), by a cyclone which has not been equalled in violence since 1863, and there was every reason to believe that the price of geranium oil would advance considerably in consequence, contrary to all calculations, the opposite has taken place, the quotations now being lower than before the catastrophy. This is owing to the fact that the new geranium plantations yielded crops in four months' time, while all other cultivated plants require a longer period, and to the further fact that they were restored on a large scale.—Schimmel's Rep., Oct.–Nov., 1904, 43–44.

Russian Oil of Juniper—Distinction from Italian and Hungarian Oils.—Speaking of the abundant harvest of juniper berries in Italy and Hungary and the satisfactory yield of oil, Schimmel & Co. draw attention to two oils of juniper berries originating from Russia, recently examined by them, which showed a dextro-rotation of + 7° to + 8° C., whilst otherwise lævorotation is just a characteristic of oil of juniper berries. As the other properties corresponded with those of the ordinary distillate ($d_{15°}$ 0.8698; ester number 15.08; soluble in 5 and more vols. 90 per cent. alcohol), and as the oils also possessed a pleasant, powerful aroma, the deviation in the optical behavior appears to be solely due to the origin of the oils. Further observations must show whether this assumption is correct, or whether perhaps some other vegetable material serves for the production of this oil.—Schimmel's Rep., Oct.–Nov., 1904, 50.

Oil of Lavender—Methods of Adulteration.—Speaking of the probable deficiency in the output in lavender oil and the consequent liability to its adulteration, Schimmel & Co. mention that there is every indication that this will be carried on this year on a very extensive scale. From a private source they learn that at the places of production spike oil comes chiefly under consideration as the adulterant, and further oil of turpentine and methylated spirit. Spike oil is either added to pure oil of lavender or the adulteration already takes place in the still by submitting mixtures of spike—and lavender blossoms to distillation. But the more skilled adulterators proceed in a decidedly more cunning manner. They use the cheap Spanish oil of sage; to this they add spike oil to give the requisite solubility, and give it the necessary aroma by the addition of a little amyl acetate. According to the same authority almost every lavender oil which contains less than 33 per cent. ester is adulterated. There are, of course, exceptions, but they are few; for example, the oils from the left bank of the Var are greatly valued by many purchasers, although they contain only 28 to 30 per cent. ester. These oils are characterized by a very low specific gravity and a fairly high lævorotation, whilst their solubility is normal. Two samples of lavender oil recently examined by Schimmel & Co. were to all appearances adulterated with petroleum or a petroleum fraction. The two oils which clearly originated from the same source, were entirely identical: $d_{15°}$ 0.8707; a_D —3°22′; ester-content 21.26 per cent.; insoluble in 10 vol. 70 per cent. alcohol. Unfortunately the quantity at their disposal was too small for an exact examination, and the nature of the adulterant could therefore not be determined with certainty.—Schimmel's Rep., Oct.–Nov., 1904, 50–52.

Oil of Lemon—Indirect Method of Estimating the Aldehyde Content.—Dr. E. Berté, although retaining confidence in the methods of analyzing aldehydes according to the potassium-hyposulphite method submitted by Soldaini and himself in 1903 (see Proceedings, 1904, 869), has turned his attention to a new method for determining aldehydes by recovering them in an indirect way by the various polariscopic deviations obtained from an oil taken *tale quale*, and from the same when it is subjected to the action of one of the common aldehydic reagents. The new process is based on the principle that if an oil deviates x, then if deprived completely of its aldehydic principle it should deviate y. From the two polariscopic observations made under the same conditions the aldehydic content would be indirectly found. The *modus operandi* is as follows:

To 10 Cc. of the oil add 50 Cc. of a saturated solution of potassium bisulphite in an Erlenmeyer flask, capacity about 250 Cc. Close it with a stopper in which is inserted a glass tube about 40 to 45 Cm. long. Shake the mixture until emulsified, and heat to boiling at 5 Mm. pressure for ten minutes, agitating frequently and taking care not to overheat it. Then allow it to cool completely, after which heat again for another five min-

utes, agitating it vigorously during the whole operation. Allow it to cool to the temperature of the surrounding air. The mass should then be put quickly into a funnel of the capacity of about 100 Cc., with a tap, and some time afterwards the floating stratum of oil is to be separated from the underlying solution of bisulphite in which the combined aldehydes are found. The terpene is to be washed twice with a little distilled water and filtered along with a little anhydrous sodium sulphate. When it is quite clear examine it with the polariscope.

The difference between the deviations of the essence and of the terpene taken (of course under the same conditions of temperature) will give indirectly the quantity of aldehydes that the oil contains according to the following formula:

$$C = \frac{100\ (A - a)}{A}$$

in which *a* represents the rotation of the original essence, A the rotation of the essence liberated from the aldehyde, and C the percentage of aldehydes. The reliability of the new method is confirmed by numerous experiments which have been made with genuine oil, with others knowingly adulterated, and with some of known composition—*i. e.*, mixtures of lemon terpene of ascertained purity, to which was added various quantities of lemon-grass citral whose rotary power was known. These are recorded in the present paper in the form of tabulated statements, which must be consulted in the translation from the Italian original, in Chem. & Drugg., April 29, 1905, 682–684.

Lemon-Grass Oil—Adulteration with Citronella Oil.—Ernest J. Parry directs attention to adulterated lemon-grass oil of recent importation. In the first parcels examined, the quantity of adulterant was so small that he was unable to identify its nature; but more recently a shipment was received in which the quantity of adulterant was so large that it could be identified as oil of citronella by the nose alone. The presence of this was determined by chemical tests, which the author describes with the experimental data. Judging from these, the samples probably contained at least 30 per cent. of citronella oil.—Chem. and Drugg., Jan. 28, 1905, 140.

Lemon-Grass Oil—Product from the Cameroons.—Schimmel & Co. have on several occasions reported on the experiments which have been made in the Botanical Garden of Victoria (Cameroons) with the cultivation of andropogon grasses for the purpose of oil manufacture. Whilst the oil distilled from these grasses was considered by Strunk, the Director of the Botanical Garden, to be citronella oil, Mannich found, from a sample sent to the Pharmaceutical Institute of Berlin, that the oil is identical with lemon-grass oil. A sample recently received from Dr. Strunk gave a result which corresponded with that obtained by Mannich. The oil had a yellow color and a powerful, pleasant aroma: $d_{15°}$, 0.8929; α_D,

—0° 8′; aldehyde-content (citral) 84 per cent.; the solubility is imperfect, inasmuch as the oil does not at all form a clear solution with 70 per cent. alcohol, and the solutions in 80 and 90 per cent. and even absolute alcohol, which are at first clear, also become cloudy with more or less strong opalescence, when more alcohol is added. The oil resembles on this point West Indian lemon-grass oil, and is as little as the latter able to replace the East Indian oil, owing to its imperfect solubility. But, on account of its high aldehyde-content, it may possibly be found suitable as crude material for the production of citral.—Schimmel's Rep., Oct.–Nov., 1904, 52.

Montserrat Lemon-grass Oil—Characters.—A specimen of lemon-grass oil from Montserrat, the botanical source of which, determined at Kew, was *Antropogon nardus*, L., var. *genninus*, Hack, examined in the Imperial Institute Laboratory, was found to contain 74.6 per cent. of citral. It had the specific gravity 0.906 at 15° C., the $[\alpha]_D$—0° 10′, and differed from East Indian lemon-grass oil only in not being completely soluble in alcohol (70 per cent.) about 3 per cent. of the oil being insoluble in that solvent. —Pharm. Jour., Oct. 29, 1904, 610; from Bull. Imp. Inst., 2 167.

Lime Oil—Character and Constants.—Schimmel & Co. having recently received from Sir Daniel Morris, Imperial Commissioner of Agriculture in Barbadoes, W. I., two limette oils originating from Dominica, subjected them to physical and chemical examination. One of these oils was obtained by expression (*hand-pressed lime oil*), the other by distillation (*distilled lime oil*), and both being authentic samples, the determination of the following constants is particularly interesting:

1. *Hand-pressed Lime Oil:* $d_{15°}$, 0.9008; α_D + 36° 17′; α_D of the first 10 per cent. of the distillate + 39° 30′; acid number 6.05; ester number 29.55; residue on evaporation 17.8 per cent.; soluble in 4 and more vol. 90 per cent. alcohol with slight cloudiness in consequence of separation of paraffin. The dilute alcoholic solution shows a faint blue fluorescence, which renders the presence of anthranilic ester probable. The oil has a golden-yellow color and possesses a pleasant refreshing odor which greatly resembles that of lemon oil.

2. *Distilled Lime Oil.* The bright-yellow oil, which possesses a disagreeable odor like turpentine or pine tar oil, had the following constants: $d_{15°}$, 0.8656; α_D + 46° 36′; α_D of the first 10 per cent. of the distillate + 53° 8′; acid number 1.8; ester number 4.05; residue on evaporation 3.16 per cent.; soluble with slight cloudiness in 4.5 and more vol. 90 per cent. alcohol.—Schimmel's Rep., Oct.–Nov., 1904, 54.

Limette Oil—Composition.—H. E. Burgess and Th. H. Page report on the composition of distilled limette oil, a concentrated oil presumably of West Indian origin. This, by distillation at reduced pressure, was divided into two principal fractions, of which the former, passing over, at 17 Mm.,

between 100° and 105° C., consisted chiefly of l-terpineol of the melting point 35° C. The liquid portions were removed from it by freezing out, and it was then purified by recrystallisation from alcohol: d_{15}° 0.941; a_D —20°; $n^{D}_{20}^{\circ}$ 1.4829; boiling point 214° C. (762 Mm.). The compound was further identified by the production of various derivatives. The other fraction, boiling from 130° to 140° C. (17 Mm.) consisted almost entirely of hydrocarbons. The authors succeeded in isolating from it a sesquiterpene $C_{15}H_{24}$ belonging to the class of light sesquiterpenes, to which they have given the name

Limonene.—This is a colorless oil, with a faint but peculiar odor, which readily resinifies and boils at 9 Mm. at 131° C., whilst at ordinary pressure (756 Mm.) it passes over between 262° and 263° with slight decomposition. The other properties of limene are: d_{15}° 0.873; a_D + 0°; $n_{D19.5}^{\circ}$ 1.4910; molecular refraction 68.2, calculated for $C_{15}H_{24}$ (with three double linkings) 67.76; with this agrees the fact that the compound absorbs 6 atoms bromine. Limonene was also found by the authors in limette oil obtained by expression, and further in lemon oil.—Schimmel's Rep., Oct.–Nov., 1903, 54; from Journ. Chem. Soc., *85* (1904), 414.

Matico Oil—Composition.—H. Thoms, after revising the results of previous experiments on the nature and composition of matico oils, which seem in some cases to have been derived from different leaves known in South America under the name of "Matico," communicates in detail his experiments with matico oil supplied by Schimmel & Co., distilled by them from the leaves, of the true matico tree, *Piper angustifolium*, Ruiz et Pavon, of undoubted origin, and evidently identical with the matico oil from the same source examined by E. Fromm and K. von Ernster in 1902. The author's results show that the principal fraction of this oil, which Fromm and von Ernster designate as matico-ether, is not a single body, but that it is composed of 3, probably of 4, different compounds, but mainly of two apiols, namely, *parsley-apoil* and *dill-apiol*, the latter being largely in preponderance. Besides these constituents, the matico oil was found to contain a *hydrocarbon*, which boils at 121°–130° C. under 13 Mm. pressure and congeals at —18° C., and a small quantity of a *phenol ether*, the composition of which has not yet been determined, which yields a bromine derivative melting at 123°–124° C., and requires further examination. Neither matico camphor nor asaron, which were noticed by experimentors on matico oils found in commerce about 20 years ago, were found in the matico oil under examination. In a second paper the author gives the details of experiments made to determine the constitution of

Dill-Apiol, according to which it may be designated as a (1) allyl-(5, 6) dimethoxy-(3, 4) methylenedioxy-benzene.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 328–347.

Oil of Monarda Didyma, L.—*Yield from Cultivated Plants and Con-*

stants.—Schimmel & Co. have distilled the oil from *Monarda didyma*, L., cultivated by themselves. It was obtained in a yield of 0.04 per cent. from the half-dried herb, had a golden-yellow color and possessed a pleasant aromatic odor somewhat like ambergris. It had the following constants: $d_{15°}$, 0.8786; a_D —24° 36′; soluble in 1.5 to 2 volumes 70 per cent. alcohol; when further diluted it rapidly became strongly turbid on account of separation of paraffin. These properties differ slightly from those of distillates of *Monarda didyma* described by Brandel sometime ago (see Proceedings, 1903, 904), but this may possibly be due less to climatic conditions, than to a difference in the method of distillation.—Schimmel's Rep., Oct.–Nov., 1904, 97.

Oil of Neroli—Formation in the Flower.—E. Charabot and G. Laloue have examined the flowers of *Citrus bigaradia* in various stages of growth, and find that the petals contain the greater proportion of essential oil. During the period of flowering the amount of essential oil increases sensibly in the flower; dry flowers are found to yield a higher percentage of oil than fresh. Contrary to what has been shown to occur in the leaves, the formation and accumulation of oil takes place more actively when the flower is fully developed than at an earlier period. The amount of esters in the oil distinctly but slowly increases. The amount of geraniol increases, while that of linalool slightly diminishes. No marked difference is observed in the constitution of the oil derived from the petals alone and that of the other floral organs, but the petal oil always contains slightly more methyl anthranilate. The oil from the flower buds, in May, 1903, contained 11.8 per cent. of total esters, 10.1 per cent. of terpenic esters, 1.3 per cent. of methyl anthranilate, 29.3 per cent. of free alcohols, and 8 per cent. of alcohols as esters. In the following June the amount of total esters was 15.1 per cent.; terpenic esters, 13.8 per cent.; methyl anthranilate, 1.0 per cent.; free alcohols, 33.1 per cent.; alcohols as esters, 10.8 per cent.; total geraniol, 10 per cent.; total linalool, 34 per cent. The whole expanded flowers gave in May an oil containing total esters, 17.1 per cent.; terpenic esters, 13.3 per cent.; methyl anthranilate, 2.9 per cent.; free alcohols, 34.9 per cent.; alcohols as esters, 10.8 per cent. In June the oil from entire full-blown flowers gave total esters, 19.2 per cent.; terpenic esters, 16.0 per cent.; methyl anthranilate, 1.9 per cent.; free alcohols, 31.9 per cent.; alcohols as esters, 13.4 per cent.; total geraniol, 15.2 per cent.; and total linalool, 30.1 per cent. It is calculated that in each flower the petals yield 0.308 Mgm. of oil, and the other organs 0.245 Mgm.; giving a total of 0.553 Mgm.—Pharm. Journ., Oct. 22, 1904, 583; from Bull. Soc. Chem. [3], *31*, 937.

Oil of Nikkei—A Product of Cinnamomum Loureirii, Nees.—Schimmel & Co. have recently had opportunity to examine an oil obtained from the leaves and young twigs of the Japanese cinnamon or cassia bark tree, *Cinnamomum Loureirii*, Nees, and which is called in Japan "Oil of Nikkei."

The nikkei tree is found in the hottest parts of Japan, viz., in the provinces Tosa and Kii. The oil, obtained in a yield of about 0.2 per cent., has a bright-yellow color and possesses a pleasant odor, reminding of citral and Ceylon cinnamon oil. The other properties of the oil are as follows: $d_{12°}$, 0.9005; a_D—8° 45′; acid number 3.01; ester number 18.6; soluble in 2 to 2.5 and more vol. 70 per cent. alcohol, with opalescence; forms a clear solution with an equal volume and more 80 per cent. alcohol. The oil contains 27 per cent. aldehydes, which consist chiefly of citral (melting-point of the *a*-citryl-β-naphthocinchoninic acid 199°). On fractionating the non-aldehydic portions, cineol and linalool ($d_{15°}$, 0.7724; a_D—27°; $n_{D20°}$, 1.46387) were found; of the last-named compound probably at least 40 per cent. is present in the oil. Contrary to the experience of Schimoyama, who obtained previously from the root bark of the same tree an oil containing *cinnamic aldehyde*, and which was also considerably heavier than the oil under discussion, the latter did not contain this aldehyde.—Schimmel's Rep., Oct.–Nov., 1904, 96.

Nutmeg Oil—Variability of Constants Due to Quality of Nuts.—Schimmel & Co. have observed that a nutmeg oil recently distilled by them had a higher specific gravity and lower rotatory power than is usual. Whereas the properties of nutmeg oil usually are: sp. gr. (at 15° C.), 0.870 to 0.920; optical rotation, + 11° to + 30°; solubility, in 1 to 3 vol. 90 per cent. alcohol, the oil in question had a specific gravity of 0.922, an optical rotation of + 7° 52′, and was soluble in 0.5 vol. 90 per cent. alcohol. These differences are attributable solely to the quality of the nutmeg worked up; in the present case the quality was particularly good, whereas the material usually employed consists chiefly of light worm-eaten nuts. The oils distilled from the latter are richer in terpenes, whilst that from the sound nuts contain more oxygenated constituents.—Schimmel's Rep., Oct.–Nov., 1904, 65.

Oil of Ocimum Basilicum—Constituents.—Van Romburgh has detected in the volatile oil of *Ocimum basilicum*, L., in addition to considerable quantities of eugenol, a new olefinic terpene $C_{10}H_{16}$, ocimene. As an olefinic terpene, ocimene has a great resemblance to myrcene, the hitherto best-examined representative of this class of bodies. Like myrcene, ocimene is capable of absorbing oxygen, whereby it is converted into a colorless viscid substance. In its physical properties ocimene differs in a marked degree from myrcene, so that the two hydrocarbons cannot be regarded as identical. C. J. Enklaar, who has again taken up the examination of ocimene in the Utrecht laboratory, obtained by reduction with sodium in alcoholic solution, a dihydro ocimene which yields a crystallized bromine addition product, and which does not agree in specific gravity with the dihydro myrcene obtained by Semmler by reduction of myrcene. —Schimmel's Rep., Oct.–Nov., 1904, 14.

Opopanax Oil—Constants, etc.—Schimmel & Co. have recently dis-

tilled some oil from the opopanax resin of commerce, and subjected it to examination with the following results: sp. gr. at 15° C,, 0.895; a^D—12°35′; saponification number 14.5; soluble in 1 vol. 90 per cent. alcohol; does not form a completely clear solution with 8 vol. 90 per cent. alcohol. When the oil was acetylised an increase in the saponification number was observed, which proves the presence of alcohol constituents. Besides a small quantity of an alcohol, possessing a peculiar odor reminding of opopanax, a hydrocarbon was isolated, which proved to be a sesquiterpene with three linkings, and which appears to be the chief constituent of the oil.—Schimmel's Rep., Oct.–Nov., 1904, 67.

Patchuoli Oil—Presence of Two Sesquiterpenes.—H. v. Soden and W. Rojahn, after repeatedly fractionating patchouli oil, obtained two fractions which yielded distinct sesquiterpenes, the one lævogyre (about—50°), the other dextrogyre (about + 45°). Neither of them yielded a crystallized hydrochloride.—Schimmel's Rep., April–May, 1905, 61; from Berichte, *37* (1904), 3354.

French Oil of Peppermint—Characters and Constants.—Schimmel & Co. observe that, generally speaking, little is known with regard to French peppermint oil, as it is mostly consumed in that country and therefore not exported. But in various districts of Southern France peppermint is grown in noticeable quanties, and an oil is distilled from it which is very popular in France. Some oils recently received were found to have the properties exhibited in the following table;

	I.	II.	III.
$d_{15°}$	0.9249	0.9108	0.912
a_D	—5° 20′	—17° 46′	—35° 18′
Ester menthol	9.95 per cent.	10.32 per cent.	20.81 per cent.
Total menthol	45.75 per cent.	50.82 per cent.	69.26 per cent.
Solubility	Insoluble in 10 vol. 70 per cent. alcohol. Soluble in 1.1 vol. 80 per cent. alcohol; with more than 3 vol. opalescence or cloudiness	Insoluble in 1.0 vol. 70 per cent. alcohol; soluble in 1.2 vol. 80 per cent. alcohol with more than 4 vol. opalescence	Soluble in 3.5 and more vol. 70 per cent. alcohol; the dilute solution is faintly opalescent in consequence of separation of paraffin

It will be seen from this table that the oils differ from each other, and are also different from the English and American distillates which oil No. III approaches most nearly. The differences between the three oils mentioned above are said to be due to the varying degrees of ripeness of the plants, but it seems likely that the condition of the soil also has an important bearing on this point.—Schimmel's Rep., April–May, 1905, 62.

Java Peppermint Oil—Source and Characters.—P. van der Wielen reports on Java peppermint oil, which is obtained from *Mentha javanica*, Bl.

(*M. lanceolata, Benth.*), a species closely allied to *Mentha canadensis*, L., and is also regarded as a variety of *Mentha arvensis*, L. This oil possesses a pleasant but not a typical peppermint odor, a bitter taste, and a bright-green color: d_{15}° 0,9214; $a_D + 4^{\circ}40'$; soluble in 1.5 parts by volume 70 per cent. alcohol. When cooled down to — 60° C., the oil congeals partly, but is also again liquid at — 15°. It contains much pulegone and but little or no menthol and menthone.—Schimmel's Rep., April–May, 1905, 64; from Pharm. Weekbl., *41*, (1904), 1801.

Sicilian Peppermint Oil—Cultivation and Characters.—John C. Umney and C. T. Bennett state that experiments are being carried out by Messrs. Santi de Pasquale et Figli, of Messina, in order to determine whether it is possible to cultivate the peppermint-plant advantageously in that district, and to ascertain whether the oil distilled from the plant grown there shows any marked variation from English and American peppermint oils. For the purpose of these experiments black-peppermint plants obtained from Mitcham have been cultivated, and therefore any change that may have taken place in the character of the oil, as the result of altered conditions of climate and soil, should be of interest. The peppermint plant appears to grow luxuriantly in Messina, and blooms early. In Britian the oil is usually distilled from the plant before it reaches that stage; indeed, the authors believe that it rarely flowers in England. Two distillations have been made in Messina from the fresh herb. The sample of oil No. 1 was distilled in July, when the plants were in full bloom, while No. 2 was a second distillation from herb which had by no means reached the full development of its second growth (the growth of the herb in the autumn being very slow), when there was no indication of flower-buds. The yield of oil from the second crop was only one-third of that obtained from the first. This slow yield was partly due to the effects of an early winter. The two oils had the following characters

	No. 1, Distilled in July (Yield 0.4 per cent.).	No. 2, Distilled in December.
Specific Gravity	0.908	0.920
Optical Rotation	−14°	−23°
Total Menthol	40.0 per cent.	70.5 per cent.
Free Menthol	36.2 per cent.	47.4 per cent.
Esters calculated as menthyl acetate	4.8 per cent.	29.4 per cent.

The No. 1 oil was soluble in four volumes of 70 per cent. alcohol; No. 2 was not, although it had been rectified, but was soluble in two volumes and upwards of 80 per cent. alcohol. In the No. 1 oil the percentage of menthol is low; the percentage of esters is also small, but in a fair ratio to the total amount. On the other hand, the proportion of esters recorded in No. 2 is extremely high—higher than in any sample of peppermint oil which the authors have had the oppor-

tunity to examine. The fact that the oil obtained by the distillation of these plants in December was only about one-third of the amount obtained when distilled in July, may have a considerable bearing on the composition of the oil; but, at any rate, the oil possesses a markedly pleasant taste, and agrees very much in character with the finest white-peppermint oil. Of course, the low yield would make it a comparatively expensive product, but, as it seems to have been a cold season, better results may be looked for this year. It would be very interesting to carry these experiments farther and see whether, by modified conditions, it may be possible to obtain an oil which corresponds fairly closely to the finest English white-peppermint oil.—Chem. & Drugg., June 17, 1905, 945.

Oil of Roses—Characters and Constants of Different Kinds.—P. Jeancard and C. Satie communicate the following characters and constants for the volatile oils of rose obtained from different sources; *French Oil of Rose*, obtained by cohobation and distillation, has the following characters; Congealing point, 25.5° C., stearoptene, 33.2 per cent. After removing this stearoptene the residual oil had the sp. g. 0.8790 at 15° C.; $[a]_D$—3° C.; solubility in alcohol, 70 per cent. 1 : 2; total alcohols, 88.55 per cent.; citronellol, 22.4 per cent. When distillation was performed *without cohobation*, and the distillate was collected weight for weight with the roses employed (as is done in making rose-water) the yield of oil was very small. This otto had the congealing point 25.9° C.; stearoptene, 58.88 per cent.; acid value, 2.24 per cent.; saponification value, 14.7 per cent.; total alcohols, 32 per cent.: citronellol, 15.10 per cent. Furthermore, the authors find that the *non-petaloid portions of French roses* grown in the Cannes district, composed of the calices, stamens, etc., when distilled give 50 Gm. per 1,000 kilo. of a green, essential oil having the following characters:—Congealing point, 8° C.; stearoptene 51.13 per cent.; sp. g. at 15° C. 0.8704; $[a]_D$—41; acid value, 6.12; saponification value, 22.4; total alcohols, 14.99 per cent; citronellol, 13.55 per cent. The stearoptene consists mainly of a body congealing at 14° C. Practically all the alcohol present a citronellol, which accounts for the high lævo-rotation of the oil.

Oil of Tea Rose was found to contain 72 to 74 per cent. of stearoptene, although its congealing point was as high as 23.5° C. This stearoptene, like that of the oil from the green floral envelopes, consisted mainly of the body melting at 14° C., and another melting at 40° C. These facts demonstrate the fallacy of basing any opinion on the value of an otto by its congealing point. The amount of stearoptene should be determined gravimetrically, and that of the citronellol in the stearoptene-free residue. 10 Gm. of otto is treated with 50 C.c. of acetone and frozen to—10° C. without stirring; the separated stearoptene is then collected on a tared filter in a funnel surrounded by freezing mixture, washed with chilled acetone, drained, dried *in vacuo* over sulphuric acid and weighed. The acetone is then distilled off the filtrate *in vacuo*, and the residue employed for the determination of the citronellol.

Bulgarian Oil of Rose of good quality is found to have the following characters: Congealing point, 19° to 21° C.; stearoptene, 18 to 23 per cent.; the stearoptene-free oil has the sp. g. 0.886—0.888 at 15° C.; $[a]_D$—1° to—3° C.; solubility in alcohol, 70 per cent., 1 :1.5; acid value, 1 to 2; saponification value, 10 to 12; total alcohol, 84 to 88 per cent.; citronellol, 30 to 40 per cent. Pharm. Journ., Oct. 15, 1904, 548; from Bull. Soc. Chim., (*3*) *31*, 934.

Oil of Rose—Constants Observed in Commercial Samples.—Willard Graham has determined the constants of three commercial samples of oil of rose, as follows:

	No. 1.	No. 2.	No. 3.
Specific Gravity, 20° C.....	0.863	0.855	0.863
Optical Rotation.....	—2° 53′	—3° 12′	—3° 12′
Congealing Point.....	7° to 10° C.	19° to 21° C.	17° to 18° C.
Acid Number.....	0.8	1.8	1.6
Saponification Number.....	11.7	15.5	12.5

The abnormal congealing point of No. 1 caused its rejection. Samples No. 2 and No. 3 were of good quality.—Proc. Penna. Pharm. Assoc., 1904, 130.

Otto of Rose—Iodine Absorption and Refractive Indices.—In contamination of the work on the iodine absorption of otto of roses by Hudson Cox and W. H. Simmons (see Proceedings, 1904, 878), the process has been applied by the latter to several samples of this season's oils, with results which very fully confirm the previous opinion as to the value of this test in judging the purity of an otto. The following are some of the results obtained, from which it will be seen that those oils which from their other constants and odor appear to be genuine have iodine-absorptions well within the limits, 187–194, previously given, while those which from analysis and odor may be classed as suspicious or adulterated have iodine-numbers ranging from 199 to 210:

	No.	Sp. gr. $\frac{30°\ C.}{15°}$	Rotation, 100 Mm. tube, at 30° C.	Refractive Index, n_D at 20° C.	Saponification Number.	Setting Point.	Iodine Number.
Genuine.	1.....	0.8560	—2° 25′	1.4613	0.6	20.4° C.	191
	2.....	0.8516	—1° 50′	1.4636	8.3	21.° C.	192
	3.....	0.8547	—3° 0′	1.4646	7.7	19.9° C.	191
	4.....	0.8535	—2° 40′	1.4626	9.9	20.7° C.	191
	5.....	0.8542	—3° 10′	1.4627	8.0	20.3° C.	189
Suspicious or Adulterated.	6.....	0.8600	—1° 53′	1.4640	9.9	20.0° C.	200
	7.....	0.8565	—2° 0′	1.4628	13.0	19.8° C.	204
	8.....	0.8607	—2° 16′	1.4654	16.2	19.4° C.	210
	9.....	0.8559	—2° 20′	1.4656	8.7	30.9° C.	199
	10.....	0.8554	—1° 34′	1.4647	11.0	21.6° C.	209

A noteworthy point in the above table is the wide variations in the refractive index, a figure which has been much recommended of late by Parry and others in the examination of otto samples. To test the value of this constant it has been determined for some thirty-six samples, twenty-three of which there is every reason to believe are genuine, the other thirteen being of doubtful quality. The satisfactory samples gave an average refractive index of 1.4626, a maximum of 1.4654, and a minimum of 1.4592, while the others varied from 1.4615 to 1.4770.—Chem. & Drugg., October 22, 1904, 703.

Spanish Oil of Rosemary—Adulteration with Oil of Sage.—Some years ago Schimmel & Co. called attention to Spanish oil of rosemary, which differed from the French and Dalmatian by its higher specific gravity and its more powerful rotation—the ester content also being higher, while saponification numbers were found up to 37, whereas these usually do not exceed 12. These differences were attributed by them to impurity, and this opinion is now confirmed by the information received from Spain that there exists in that country, besides the ordinary rosemary oil of normal character, also an oil designated

Rosemary Oil Courant, which is distilled from rosemary and sage, and which differs in the manner above explained from the ordinary rosemary oil. Such an oil has recently been examined by Schimmel & Co., and was found to have the following constants: Sp. gr. at 15° C., 0.9258; optical rotation, + 14° 35′ (of the first 10 per cent. = + 0°, 40′); acid numbers, 0.9; ester number, 35.7; soluble in one or more vol. 80 per cent. alcohol. —Schimmel's Rep., Oct.–Nov., 1904, 82.

Sandal-Wood Oils—Santalol Content and Characters.—Dr. P. Seidler has examined the following sandal-wood oils:—East Indian oil from *Santalum album*, (2) Macassar oil also from *Santalum album*, (3) Australian oil from *Santalum* var. species, (4) African oil (source doubtful), (5) West Indian oil from *Amyris balsamifera*. The likely adulterants mentioned are alcohol, fatty oils, cedar-wood oil, gurjun oil, copaiba oil, etc. As santalol appears to be the active constituent of the oil, tests suitable for the examination of this constituent are suggested. Santalol is a thick, colorless liquid either odorless or with a faint odor of sandal-wood. Its specific gravity should be at least 0.980, and it should form a clear solution with four parts of 70 per cent, (by volume) alcohol. Its optical rotation is from — 18° to — 19° and the bulk distills between 302° and 306° C. Acetylated santalol should require a defined quantity of potassium hydroxide solution for saponification. A good sample of East Indian oil should be pale yellow in color, possess a slight odor and that only of sandal-wood; specific gravity, 0.975 to 0.985; optical rotation — 17° to — 19°. It should dissolve in five parts 70 per cent. (by volume) alcohol, have an acid number no higher than 2.75, a saponification number no higher than 7.5,

an ester number of 5 at most, and an acetyl-saponification number at least 197. The bulk should distill between 297° and 305° C.—Apoth. Ztg., *19*, No. 80, 795–799.

Volatile Oil of Sandarach Wood—Yield and Characters.—E. Grimal finds that sandarach sawdust, from the wood of *Thuja articulata* (*Callitris quadrivalis*), yields, on distillation with steam, 2 per cent. of dark reddish-brown lævorotatory essential oil with a phenolic odor; specific gravity, 0.991; soluble in all proportions in alcohol (80 per cent.). It contains about 5 per cent. of phenols removable by alkali, consisting of carvacrol and thymohydroquinone. Thymoquinone is present in the alkali-insoluble non-phenol portion.—Pharm. Journ., Febr. 18, 1905, 235; from Compt. rend., *139*, (1904), 927.

Oil of Savin—Yield from the Dry Drug, Character, Etc.—E. F. Ziegelmann obtained from 100 lbs. (43.35 Kgm.) of commercial savin by steam distillation a total of 24.64 Gm. (= 0.0568 per cent.) of volatile oil. Of this 7.3 Gm. (= 0.01544 per cent.) was separated from the surface of the aqueous distillate, the remainder (17.34 Gm. = 0.03822) being obtained by shaking the aqueous distillate with petroleum ether and evaporation of the ethereal solution. The yield of volatile oil from *fresh* material, being stated in "The Volatile Oils" (G.—H.—K) to be between 4 and 5 per cent., that obtained from the commercial drug is so insignificant as to demand an inquiry into some other cause than that of the volatilization. Experiments made in that direction prove the presence of 10.5 per cent. of a soft resinous substance, which was extracted by ether, and it therefore seems plausible that some of the volatile constituents of the fresh leaves have resinified as well as volatilized. *The first oil* had the sp. gr. 0.91329 at 25° C.; it was optically inactive, soluble in an equal part of 90 per cent. alcohol, and in 16 parts of 80 per cent. alcohol, but insoluble in 20 p. of 70 per cent. alcohol. The acid number, in two determinations, was 6.538 and 7.33; ester number, 109.1 and 111.9; giving the saponification numbers, 115.73 and 119.23, respectively. The ester numbers correspond to a sabinyl acetate content of 37.802 to 38.95 per cent. *The second oil*, after rectification, was reduced to 14.38 Gm. It was an amber color, had a terebinthinate oil, sp. gr. 0.9146 at 25° C., and, like the first oil was optically inactive.—Pharm. Rev., Jan., 1905, 22–24.

Oil of Tanacetum Boreale, Fisch.—Yield from Cultivated Plants and Constants.—Schimmel & Co. have obtained from the half-dried herb of *Tanacetum boreale*, Fisch., cultivated by themselves, 0.12 per cent. oil having a yellowish color and a powerful thujone odor. $d_{15°}$ 0.9218; a_D + 48° 25′; forming a cloudy solution with about 8 vol. 70 per cent. alcohol, with abundant separation of paraffin. The foregoing shows that the oil from this plant which is indigenous to Siberia, fairly closely resembles common oil of tansy in its properties. Schimmel's Rep., Oct.–Nov., 1904, 97.

American Oil of Turpentine—Important Synthetic Products.—Referring to an interesting paper on "Pine Products" written by H. W. Pritchard for the "Scientific American," Dr. L. Reuter directs attention to the fact that there are several important products made in Germany from American oil of turpentine which are not as yet manufactured in the United States, namely terpin hydrate and terpineol. The first named, terpin hydrate is used so largely in the United States, that about 35,000 pounds of it, prepared exclusively from American turpentine oil, are annually imported; while terpineol, which is largely used as a perfume resembling in odor that of the lilac, is imported in still larger quantity, the annual importation amounting to about 45,000 pounds. The author insists that these synthetics, as well as synthetic eucalyptol (which see under "organic chemistry") and synthetic camphor could best and most profitably be prepared in the southern part of this country, especially in the pine region, where oil of turpentine is made on a large scale either from the turpentine or by distillation of pine wood, and that when this industry is properly developed it would be an easy task to supply the world from here with articles of as good a quality and as cheaply or cheaper than German factories. American manufacturers would have a further advantage in so far as they could use certain discolored grades of turpentine or grades obtained from pine wood by destructive distillation and containing traces of creosote, etc. That such cheaper grades can be used for manufacturing purposes, that the yields and the quality of the final products are perfectly satisfactory, and that the products are identical with those made from the purest oils, the author can confirm from his long experience in that special line of manufacture.—Midland Drugg., Jan., 1905, 422–423.

Oils of Wintergreen and Birch—Comparative Yield and Characters.—In the course of some pharmacopœial experiments it became necessary to compare specimens of the oils of wintergreen leaves and birch bark of unquestioned authenticity. Accordingly E. F. Ziegelmann undertook the preparation of such and now records some interesting observations made in this connection. Having ascertained what appeared to be the most favorable condition for distilling the

Oil of Birch, the rather thick pieces of sweet birch bark were coarsely ground and distilled until the aqueous distillate was almost tasteless. The oil which separated amounted to 0.306 per cent. and from the aqueous portion of the distillate a second portion of oil was obtained by cohobation, amounting to 0.076 per cent., making the total yield 0.383 per cent. This falls short of the calculated yield by about 36.1 per cent. The constants of these two oils were determined separately. Both were soluble in four parts of 70 per cent. alcohol, in one part of 80 per cent. alcohol and miscible in all proportions with 90 per cent. alcohol. The first distillate had a sp. gr 1.1585, and contained 90.505 per cent. of methyl salicylate; the cohobated oil had the sp. gr. 1.1502, and 90.42 per cent. of methyl-

salicylate content. When united, twice rectified and dried, the sp. gr. was 1.171 and the methyl salicylate content 96.83 per cent., the total quantity of oil having been reduced to 0.324 per cent.

Oil of Wintergreen was yielded from the leaves after proper maceration to the amount of 0.2889 per cent. directly, and an additional quantity of 0.383 per cent. was obtained by cohobating the aqueous distillate, making a total yield of 0.633 per cent. This falls short of the calculated quantity by 55 per cent., and was further reduced by double rectification and drying to 0.497 per cent. Both fractions were miscible with 90 per cent. alcohol in all proportions; but the first oil required 2 parts of 80 per cent. alcohol and 7 parts of 70 per cent. alcohol, while the cohobated oil required only one and two-third parts of 80 per cent. and 6 parts of 70 per cent. alcohol for solution. The other constants were as follows:

	Sp. Gr. at 25°.	Methyl salicylate.
First distillate	1.1585	90.505 per cent.
Cohobated oil	1.1507	90.42 per cent.
Combined oil, twice rectified and dried	1.185	97.131 per cent.

—Pharm. Rev., March. 1905, 83–85.

ALCOHOLS AND DERIVATIVES.

Alcohols—Color Reactions with Furfural.—G. Guerin finds that when certain alcohols are treated with a saturated solution of furfural and a few drops of strong sulphuric acid, characteristic color reactions are obtained. Normal propyl alcohol gives a deep violet color; secondary propyl alcohol a reddish-violet; isobutyl alcohol, bluish-violet; amyl alcohol, violet; caprylic alcohol, reddish-violet; glycol, reddish-violet; propyl glycol, violet-purple, becoming brown; glycerol, reddish-violet; allyl alcohol, reddish-brown; almost instantly decomposed; menthol in alcoholic solution, blue; mannite, in sulphuric acid solution, dull greenish-brown; in alcoholic solution, violet-brown; glucose, brownish-violet; lactose, brownish: malic and tartaric acids, brownish-violet; citric and lactic acids, reddish-violet; cholesterol and anthesterine, in alcoholic solution, blue; phenol, reddish-violet; thymol and guaiacol, violet; orcine, blue; hydroquinone, dull blue; pyrocatechin, in alcoholic solution, deep violet; resorcin and phloroglucin, violet; pyrogallol, reddish-violet.—Pharm. Journ., Jan. 28, 1905, 115; from Journ. de Pharm. et Chim., 1905, *21*, 14.

Chlorœthoform—A Distinctive Title for "Anæsthetic" Chloroform.—The observation that the small quantity of ethyl chloride present in chloroform obtained from ethyl alcohol renders it safer as an anæsthetic than pure chloroform derived from acetone, leads John Wade and Horace Finnemore to suggest the addition of a small percentage of ethyl chloride to pure chloroform, and to propose for this mixture the term *chlorœtho-*

form, as distinguished from the chemical individual, trichloromethane or chloroform. Pure chloroform, it is true, acts rapidly and reliably in perhaps four cases out of five, but the risk of accident is always present; this risk, experience shows, is markedly less with chloroform made from alcohol. The 0.05 per cent. of ethyl chloride present in alcohol-derived chloroform is not sufficient, however, to eliminate all uncertainty, and the authors therefore recommend the addition of a further quantity. Acetone-derived chloroform to which 0.25 per cent. of ethyl chloride has been added works with remarkable smoothness, and so far there has not been the slightest difficulty in the induction and maintenance of anæsthesia by its means. This renders the preliminary use of ether or A. C. E. unnecessary, and appears to be one of the safest of known anæsthetics.—Chem. & Drugg., Oct. 8, 1904, 611.

Methyl Alcohol—Source, Uses and Methods of Detection.—Dr. H. W. Wiley has contributed an interesting paper on methyl alcohol, what it is and what are its uses, in which he reviews its source, the method of its production, and particularly its legitimate and practical uses, as well as the proposed uses for which it should be avoided. Owing to its poisonous nature, the proportion of interested parties to employ it for the preparation and in the preparation of certain medicaments is particularly reprehensible. The flooding of our country with various medicines in which alcohol constitutes the chief valuable constituent without control, without notification and without the consumer, is a practice that merits condemnation whether that alcohol be ethyl or methyl. If it be methyl alcohol, the practice should receive an additional condemnation because of the greater toxicity of this compound.

Complementary to the preceding paper is one by Prof. Samuel P. Sadtler in which he subjects the various methods proposed and in use for the detection of methyl alcohol in liquids containing ethyl alcohol, which is particularly interesting because of the explanation in detail of the methyl alcohol test introduced into the U. S. Pharmacopœia, 1900. The subcommittee of the U. S. P. Revision Committee undertook a careful testing of the modified Mulliken and Scudder method and tested the several color reactions suggested to distinguish the formaldehyde produced in the suitably diluted liquid (containing methyl alcohol) by the oxidizing effect of a red-hot copper spiral. They found that the resorcinol test seemed more delicate than the phloroglucinol test, and, in addition, that the alkaline phloroglucinol reagent does not keep as satisfactorily as the resorcinol solution, so that the latter has been adopted for the official test, which they believe can be carried out with uniform results by any careful experimenter.—Amer. Journ. Pharm., March, 1905, 101–110.

Methyl Alcohol—Convenient Method of Detection.—The "Farmaz. Westnik" (1904, *8*, 167) calls attention to a method for the detection of methyl alcohol, which, although not suited for its forensic determination

is convenient for ordinary purposes. The tincture, fluid extract or other alcoholic preparation is subjected to distillation, the first 3 or 4 Cc. are mixed with a little pure alcohol, the mixture is poured into a shallow evaporating dish, ignited and covered with a glass funnel, the edges of the latter being elevated 1 to 2 Cm. above those of the dish. The formaldehyde vapor escapes through the funnel tube and is readily recognized by its odor. It is claimed that the presence of 5 per cent. methyl alcohol may in this way be detected in alcoholic preparations.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 863.

Formaldehyde—Estimation of Methyl-Alcohol Present.—Guehm and Kaufler describe a new method for the estimation of methyl alcohol in formaldehyde solution, which depends on the formation of a non-volatile condensation product of the formaldehyde with sodium sulphanilate, distillation of the methyl alcohol present, and estimation of the latter in the distillate by means of the pyknometer. The authors state that by their methods, the details of which must be consulted in the original, the limit of error did not exceed 0.5 to 0.6 Gm. in 100 Gm. of the liquid under examination; but, while the method is simple, the large amount of sodium sulphanilate required—90 Gm. for 20 Cc. of formaldehyde—is not calculated to make the method popular for the industrial examination of formaldehyde solutions.—Pharm. Ztg., *49*, No. 62 (Aug. 3, 1904), 651; from Ztschr. f. angew. Chem., 1904, No. 21.

H. Bamberger has compared the above method with the well-known older method depending on the formation of oxymethylenesulphonate of sodium by the condensation of formaldehyde with sodium bisulphite. He finds that by the sulphanilic acid method, a small splitting-up of the condensation product cannot be avoided, and that in consequence the high specific gravity of the aldehyde passing into the distillate—amounting to about 0.5 Gm. under the conditions of the test—the results are materially vitiated; while in the bisulphite method the decomposition of the oxymethylenesulphonate of sodium in neutral solution is almost nil. Moreover, the method is inexpensive, the cost of the bisulphite being so small that it may be disregarded.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 758; from Ztschr. f. angew. Chem., 1904, No. 35.

Methyl Arsenic—Preparations.—According to Auger, methyl-arsenic, $(CH_3As)_4$, is obtained by heating a solution of 275 Gm. sodium methyl-arsinate, 300 Gm. sodium hypophosphite, 300 Gm. sulphuric acid, sufficient water to make 1 liter, on a steam-bath, and subjecting the heavy, yellowish liquid, which has a garlicy odor and is composed of about 90 per cent. of methyl-arsenic and 10 per cent. of arsenous acid, to distillation in a vacuum. The first portions of distillate so obtained consist of pure methyl-arsenic. Methyl-arsenic is a yellowish, oily body which is not attacked by alkalies, and is only slowly oxidized on exposure to the air, but by a trace of HCl it is polymerized and converted into a black-brown pow-

der. It is soluble in concentrated sulphuric acid, with formation of an oxide and elimination of SO_2; while nitric acid oxidizes it with formation of methyl-arsenic acid and arsenic acid.

Ethyl-Arsenic is obtained in a precisely similar manner. It also forms a yellowish oil, which is however polymerized with more difficulty than is methyl-arsenic.—Pharm. Ztg., *49*, No. 73, (Sept. 10, 1904), 770; from Rep. de Pharm., 1904, No. 8.

Formaldehyde—Ammonia Method of Assay.—Bruce N. Gleissner and L. E. Sayre find that of the various methods that have been described for the assay of commercial formaldehyde, the so-called ammonia method, which is based on the reaction of free ammonia upon formaldehyde to form hexamethylene-tetramine, is for ordinary purposes sufficiently accurate. It is the one recommended for this purpose by (the late) Professor A. B. Prescott in the laboratory of the University of Michigan. The assay is conducted as follows: 25 Cc. of normal ammonia solution is run into a flask containing about 2.25 Gm. of the formaldehyde solution. The flask is then closed with a glass stopper thickly coated with petrolatum. The mixture is shaken and then allowed to stand, with occasional shakings, two hours, and the excess of ammonia titrated with normal sulphuric acid using rosalic acid as an indicator. Each Cc. of normal ammonia used corresponds to 0.045 Gm. of formaldehyde. Three samples of formaldehyde were tested in this manner, showing the following percentages: 36.65, 35.25 and 37.41. The authors call attention to the fact that the apparent strength increases if the mixture of ammonia and formaldehyde is allowed to stand for some time, owing to the escape of ammonia, before determining the excess of ammonia employed. When the mixture was allowed to stand over night, this increase amounted to from 1.2 to 1.8 per cent.—Drugg. Circ., Sept., 1904, 192.

Formaldehyde—Determination in the Commercial Solution.—C. A. Male, after a critical examination of a number of methods prepared for the determination of formaldehyde, among which he finds that of G. Romijn most simple and rapid, suggests the following detailed plan for carrying out the method recommended by H. Schiff (see Proceedings 1903, 923): Introduce 2 Gm. neutral ammonium chloride, dissolved in 20 Cc. of water, into a flask or bottle of about 200 Cc. capacity, having well-fitting stopper. Dilute 10 Cc. of the formaldehyde solution to 100 Cc. with water, and neutralize with sodium hydrate solution, as the formaldehyde solution generally contains varying quantities of formic acid. Add 20 Cc. of this neutralized solution to the ammonium chloride solution, then 25 Cc. of $\frac{N}{1}$ NaOH, and immediately stopper the flask and leave for one hour. Afterwards determine the excess of alkali with $\frac{N}{2}$ H_2SO_4, using rosalic acid or litmus solution as indicator, both of which give a sharp end reaction. The reaction and calculation is the same as for Schiff's method, being based upon the following equation: $2NH_4Cl + 3CH_2O + 2KOH = N_2(CH_2)_3 +$

$2KCl + 5H_2O$. 1 Cc. $\frac{N}{1}$ KOH is equivalent to 0.045 Gm. of formic aldehyde. This modified method is quite as simple, and gives results practically identical with that of Romijn.—Pharm. Journ., June 10, 1905, 844.

Formaldehyde—Phloroglucin as a Reagent for Its Detection.—After a critical review of the different methods proposed and in use for the detection of formaldehyde, Albert P. Judd describes the following simple method which is applicable for its detection in milk as well as under the provision made, in liquids containing certain other aldehydes. The reagents required are a 5 per cent. aqueous solution of sodium hydroxide and a 1 per cent. solution of phloroglucin in aldehyde-free alcohol. Ten Cc. of milk in a test-tube are shaken with a mixture of 10 Cc. of the sodium hydroxide solution and one or two drops of the phloroglucin solution. In the presence of formaldehyde the mixture assumes a reddish color, at once if in large amount, slower and fainter in color if present in smaller amount—the method being applicable even in dilutions of (1 : 100,000). Other aldehydes will give nearly the same results, but the color produced disappears or fades sooner, and apparently within definite limits. This enables the detection of formaldehyde even in the presence of amylic- or ethylic aldehydes; for the color produced by *amylic aldehyde* fades completely in four minutes; that produced by *ethylic aldehyde* in from six to eight minutes; while the rose color produced by *formic aldehyde* was permanent for twelve minutes and then faded to a yellowish-brown color, which was permanent. The author regards the method as being exact, convenient and reliable.—Proc. Penna. Pharm. Assoc., 1904, 200-201.

Formaldehyde—Invariable Presence in Smoke.—According to the researches of A. Trillat, formaldehyde is invariably present in the products of combustion and smoke whenever organic matter is burnt, varying in the proportion from 1 : 1,000 to 1 : 10,000 of such substances as wood, paper, pure cellulose, rubber and tobacco. Even simple hydrocarbons, such as benzene, give an appreciable quantity, 1 : 120,000 of its weight, when it is burnt; toluene gave 1 : 80,000, and xylene 1 : 40,000. Although the amount formed may vary with the conditions under which the organic matter is consumed, formaldehyde is a constant and normal constituent of the combustion products. Probably the air of smoky manufacturing towns will prove to be richer in formaldehyde than that of ordinary localities.—Pharm. Journ., Sept. 3, 1904, 379; from Comptes rend., *138*, 1611.

Paraformaldehyde — Solubility.—In a contribution on the action of formaldehyde upon various inorganic compounds (nitric, sulphuric and phosphoric acids), L. Vanino and L. Seemann mention that the literature contains contradictory statements concerning the solubility of paraformaldehyde. While most authorities state that paraformaldehyde is insoluble in water, it is stated in an excellent treatise on medicaments that, although insoluble in water, alcohol and ether under ordinary conditions, it becomes

completely soluble when it is heated to 100°. The authors find this statement to be incorrect. They find that even by boiling with water paraformaldehyde does not dissolve appreciably.—Pharm. Centralh., *45*, No. 39 (Sept. 29, 1904), 735.

Diformaldehyde, $(CH_2O)_2$.—*Formation, Isolation and Properties.*—The properties of formaldehyde in aqueous solution have heretofore been the subject of comprehensive study and a number of polymeres have been identified and studied by Tollens, Maier, Tosekann, Segewitz and others. Among these polymeres, diformaldehyde, $(CH_2O)_2$, has hitherto been observed by Tollens, but only in freshly prepared solution, being subject to rapid change, and it consequently had not been isolated. Dr. Korbes having for some time directed his researches to the properties of formaldehyde in organic solvents—such as chloroform, ether and benzol—has obtained different bodies, which are still in process of examination. Among them he finds that if formaldehyde is passed into perfectly dry chloroform, free from acidity, flocculent precipitate forms—the reaction being markedly facilitated under the influence of sunlight—, which, when freed from the mother-liquor by suction, washing with absolute-ether, and drying in a vacuum, proved to be the diformaldehyde, $(CH_2O)_2$ of Tollens in a solid condition. This body is readily soluble in water, and melts, under simultaneous sublimation, at 130°C. The mother-liquor contains another form of formaldehyde. Both bodies require further examination, the present communication being made mainly to insure priority.—Pharm. Ztg., *49*, No. 58, (July 20, 1904), 608.

Fusel Oil—Formation Due to the Action of Bacteria.—Repeated experiments made by O. Emmerling, using different yeasts and carbohydrates, prove that, so long as the material is perfectly pure, fusel oils are either not produced at all, or else in only very minute quantities. Hence, the formation of fusel oils is due to the action of bacteria upon the carbohydrates. This has been conclusively proved by many experiments. The author has not succeeded in isolating these bacteria, though he has repeatedly met with the same forms in fermentations. The most suitable materials for the formation of fusel oils, appear to be starch and saccharose, especially if they have not been subjected to hydrolysis. As by-products of the reaction hydrogen and carbon dioxide are formed and also butyric acid. Pentoses also appear to be capable of giving rise to fusel oils. The examination on a small scale of the fusel oils obtained showed the presence of propyl, butyl and amyl alcohol, and traces of ethyl alcohol. The time in which fermentation is completed varies very considerably; usually all the fusel oil is formed in four weeks, sometimes much sooner. In a few cases, for some unexplained reason, no higher alcohols whatever are formed.—Chem. News, Nov. 18, 1904, 256; from Berichte, *37*, No. 14, 1904.

Fusel Oils—Production from Potatoes by Bacillus.—Hans H. Pringsheim

has isolated from American potatoes a bacillus which may be partly responsible for the potato fermentation observed by Emmerling (see above). Sterilized potatoes, on addition of this bacillus, yield an oil which smells strongly of amyl alcohol, and distils over between 112° and 130° C. Three forms of these bacteria were observed; one of these, which is very much smaller than ordinary potato bacilus when it acts on potatoes, gives rise to a distinct odor of amyl alcohol. It forms spores on the potato at 35°; these are readily recognized by the various colorations produced. The experiments do not clearly show how far this form is responsible for the formation of fusel oil during yeast fermentation, and it does not appear that they cause the formation of the higher alcohols in distilleries.—Chem. News, May 12, 1905, 222; from Berichte, *38* (1905), No. 2.

Amyl Alcohol—Estimation of Ethyl Alcohol Present.—Ball recommends the following method for determining the amount of ethyl alcohol that may be present in amyl alcohol, which, when of official (G. P.) quality, as reagent, should contain none of it: 20 Cc. of the sample, 20 Cc. of benzene, and 60 Cc. of concentrated solution of salt (sodium chloride) are shaken together. After subsidence, 50 Cc. of the salt solution are subjected to distillation, and the ethyl alcohol determined in the distillate on the basis of its specific gravity. In this way it has become possible to determine the presence of 5 to 7 per cent. of ethyl alcohol in commercial amyl alcohol.—Pharm. Ztg., *50*, No. 9 (Feb. 1, 1905), 91; from Chem. Ztg., 1905, No. 3.

Phenol—Volumetric Estimation.—In the process usually followed for the volumetric estimation of phenol, depending on the formation of tribromphenol with bromine in excess, determination of this excess as iodine with thiosulphate, using starch as indicator, etc. F. X. Moerk finds that the precipitate of tribromphenol interferes somewhat with the end reaction. To overcome the difficulty he has recently been using a small quantity of chloroform, which is added after most of the brown color (due to freed iodine) has been discharged by the thiosulphate. The chloroform dissolves the tribromphenol and allows a very sharp end reaction. The only precaution necessary is to continue the addition of thiosulphate as long as a blue color (starch iodide) is imparted to the aqueous supernatant liquid upon thorough agitation with the chloroform.—Proc. Penna. Pharm. Assoc., 1904, 95.

Phenol—Bacteriological Standardization and Comparison.—D. Sommerville has made comparative experiments on the germicidal action of various disinfectants. He finds that a 1 per cent. solution of pure phenol has the same bactericical effect as a 2½ per cent. solution of "formalin" (= 40 per cent. formic aldehyde in water), or, practically, a 1 per cent. solution of formic aldehyde, and a 50 per cent. solution of the disinfectant exploited under the name of "Sanitas."—Pharm. Journ., July 9, 1904, 42; from Br. M. J., Feb., 1904, *15*.

Carbolic Acid—Sulphurous Acid a Preventive of Red Coloration.—L. Reuter, referring to some experiments recorded by him some fifteen years ago concerning the prevention of the reddening of carbolic acid by means of sulphur dioxide, now mentions that in the light of the success of the method and further experience, this may be best effected as follows: Liquefied carbolic acid containing 10 per cent. of water is saturated with sulphur dioxide gas until it contains about 10 per cent. of the latter. This saturation is effected under cooling and the sulphur dioxide must be purified by careful washing, but it is not necessary to dry; or, if preferred, liquefied sulphur dioxide may also be used. The 10 per cent. solution is a yellow liquid and has a very strong sulphurous odor. If 50 Cc. of this solution, containing 5 Gm. of the sulphur dioxide, be added to the contents of a drum holding about 200 Kgm. of melted carbolic acid, and the contents thoroughly mixed, then the phenol will contain about 0.0025 per cent. of sulphur dioxide, and a five per cent. carbolic acid water will contain 0.000125 per cent., a quantity which may surely be regarded as unobjectionable. It was found that under such addition certain brands of carbolic acid of English manufacture sometimes assumes a yellowish tinge; that German acid would give no coloration whatever, if originally white; and that even such as had arrived slightly red colored from the manufacturer could be rendered colorless by macerating the well covered melted acid, preferably in a chamber heated by a steam coil, with 25 to 50 to 75 Cc. of the sulphurous liquor for each 200 Kgm. of the melted acid. The same sample of carbolic acid that remained colorless after treatment with sulphur dioxide as described, became slightly reddish in a short time when not so treated, even when kept in a dark place and in tightly closed bottles—finally becoming dark red and in some instances after a few months or years even blackish-red. After having now been kept for over ten years, these samples containing traces of sulphur dioxide are to-day perfectly white.—Pharm. Rev., Febr., 1905, 49–51.

Polyphenols—A New Color-Reaction.—E. P. Alvarez finds that when 0.2 Gm. of pure sodium dioxide is placed in a small porcelain capsule with 0.04 Gm. or 0.05 Gm. of the phenolic body to be tested, and then 5 Cc. of absolute alcohol are added, followed after five minutes' rotation of the liquid by 15 Cc. of cold water, a very distinctive series of color reactions may be obtained with polyphenols, their isomers, and higher organic compounds. The water must not be added to the mixture before the absolute alcohol or it will take fire. *Pyrocatechin* gives a transitory pale pink, changing to green, then brown; *resorcin*, pale yellow, becoming permanently green; *hydroquinone*, intense reddish-yellow, with blue edges if a film be blown on, ultimately a persistent orange; *pyrogallol*, reddish-brown or dull red, passing to intense red with yellow edges, and, finally orange; *oxyhydroquinone*, reddish-violet, then a black deposit with brown liquid; *phloroglucin*, a blue-violet color, increased on adding the water; *arcin*, an

intense pink, resembling infusion of roses on dilution; *homopyrocatechin*, blue-violet, changing to red and reddish-brown with water; *thymohydroquinone*, intense orange, becoming wine-red with water.—Chem. News, March 17, 1905, 125.

Cresols—Toxicity as Compared with Phenol.—Experiments made by Tollens upon frogs, mice, and cats with phenol and sodium phenate as compared with the toxic action of ortho-, meta-, and para-cresol, and their respective sodium salts, shows that para-cresol is more poisonous than phenol, that ortho-cresol is about equal in its activity to phenol, and that meta-cresol is less powerful than either of the others. The same relations hold for the sodium salts of these compounds.—Pharm. Journ., March 18, 1905, 405; from Arch. f. Exp. Pathol., *52* (1905), 220–241.

Cresolum Crudum, G. P.—Liability to Variation.—While it is a comparatively easy matter to determine the total cresol content of the crude cresol official in the G. P., this does not necessarily lead to a satisfactory determination of its true bactericidal value, since the total cresols are composed of three isomeric kinds—ortho-, meta- and para-cresol—having different bactericidal efficiency. According to E. Schulze, there are present in the proportions of 40 per cent. meta-cresol, 25 per cent. para-cresol, and 35 per cent. ortho-cresol, the latter being considered the least efficient. Much depends therefore on the relative proportions of these, and particularly of the comparatively inefficient ortho-cresol to the others. Fischer and Koske have recently subjected crude cresol, responding to the official (G. P. IV) requirements to analysis, and ascertained the following composition:

	Percentage.	Boiling-Point.
1. Water	0.35	188°
2. Phenols of the forerunnings	2.34	
3. Mixture of the 3 cresols	94.5	188°–202°
4. Mixture of the cresols with small quantities of xylenols	1.23	200°–202°
5. Mixture of the cresols with larger quantities of xylenols	1.45	202°–210°
6. Xylenols (higher phenols)	0.06	210°–225°
7. Residue (black pitch)	0.07	

From 0.3 to 0.5 per cent. of pyridine bases were also found.

It is suggested that the value of cresol be determined by fractionation. The forerunnings, up to 185° C.; ortho-cresol (b. p. 185°–186° C.) the fraction from 185°–190° C.; mainly meta- and para-cresol the fraction from 190°–195° C.; meta- and para-cresol (b. p. 199–°201° C.) only, the fraction from 195°–210° C. and higher phenols, the fraction from 210° C. upward.—Pharm. Ztg., *50*, No. 7 (Jan. 23, 1905), 70.

Phloroglucin—Experimental Inquiry Concerning its Presence in Plants.—It is a common practice to determine the presence of lignified membrane in plants by the red coloration produced by the reaction of phloroglucin and

hydrochloric acid upon vanillin contained in such lignified membranes. On the other hand it is well known that this red coloration occurs in many plants when vanillin and hydrochloric acid are applied to them, this reaction being generally attributed to the presence of phloroglucin present in them, although it is known that other phenols produce the same reaction. Calling attention to these reactions, C. Hartwick and M. Winckel record the results of experiments undertaken with the main object in view of determining, on the one hand, whether the red coloration produced by vanillin and HCl to a reaction with free phloroglucin existing in the plants, as has been recorded by the investigations of Waage (1890), or whether, as demonstrated by the experiments of Moeller (1897), this reaction is attributable to the tannins and tannoids contained in them; that phloroglucin, in a free state, could not be determined in the plant substances investigated, and that it cannot, therefore, be regarded a normal constituent of plants. Inasmuch as even Waage had admitted that other phenols produced a reaction similar to phloroglucin, the authors preliminarily determined the extent in which phenols are capable of producing the red coloration with vanillin and HCl, and found that various degrees of red were producable by the following: Thymol, guaiacol, resorcin, cresorcin, orcin, pyrogallol, pyrogallol dimethylether, phloroglucin, oxyhydroquinone, eugenol and saprol; but not with phenol, pyrocatechin, hydroquinone, or pyrogallol trimethylether. The reaction cannot therefore be longer designated as a "phloroglucin-reaction," but, in a limited sense, as a "phenol-reaction." The reaction of macturin and catechin, noted by Weselsky (1875–6), being doubtless due to the phloroglucin molecule contained in them, other bodies yielding phloroglucin were subjected to experiment, the following being found to give the reaction: Phloridzin, macturin, luteolin, morin, catechin, filizin, and gentisin. The authors then endeavored to isolate and determine the presence of free phloroglucin in a number of plant substances which give decided reactions with vanillin and HCl—in the bark of the young branches of *Platanus orientalis*, in oak bark, in cinchona bark, in tea, rhubarb, the rhizomes of *Filicis* and *Galangæ*—but none of these yielded or contained phloroglucin. In all the cases *the reaction was proven to be due to their tannin content.* Furthermore, the investigation was extended to a large number of plant substances containing tannoids, and it was found that some of the tannoids were incapable of producing the reaction, notably: the tannoids contained in divi divi hulls (*Cæsulprinia coriria*, Willd.); in the bark of *Punica granatum*, L.; in the myrobalanes of *Terminalia chebula*, Ritz.; in the leaves of *Hammamelis virginiana*, L.; in coffee; in the leaves of *Ilex paraguaiensis*, St. Hil; in the seeds of *Strychnos nux vomica*, L.; and in the wood and bark of *Fabiana imbricata*, R. et P. Summing up, the authors conclude, in so far as the reaction of tannins and tannoids with vanillin and HCl is concerned, that

The reaction is produced: (1) By all phloroglycotannoides: (2) by the oak bark tannoid; (3) by the cinchona bark tannoid.

The reaction fails of production with all substances that contain the following divisions of the non-glucosidal tannoids belonging to the class of gallotannoids: (1) the tannogens (proto-catechuic acid, gallic acid, dioxycinnamic acid; (2) the galloanhydride tannoids (digallic acid, trigallic acid, ellagic acid, ellagentannic acid, chelulinic acid, and the tannin of hamamelis). The reaction also fails in the case of those glucosidal tannoids which have no basic phloroglucin molecule and which are derived from a dioxycinnamic acid molecule. These are the tannoids of coffee, maté, strychnos-seeds and *Fabiana inbricata*.

But while in all of the before-mentioned cases in which the reaction with vanillin-hydrochloric acid was obtained, tannic acid was invariably a constituent, there remain a few substances examined by the authors in which the reaction resulted notwithstanding they fail to give the reactions for tannin. These are the rhizome of *Acorus calamus*, catechin, dragon's blood, kino and herabol-myrrh. In the case of calamus and herabol-myrrh, the substances producing the reaction have not yet been determined by the authors, but will be subject for further investigation. In that of catechin, dragon's blood and kino, it is referable to phloroglucin resulting from their decomposition. Resinous substances that fail to give the reaction are: Bisabol-myrrh, aloes, benzin, storax, balsam of Peru, balsam of tolu, ammoniac, asafetida, galbanum, Umbeliferæ-opoponax, Burseraceæ-opoponax, olibanum, elemis, Mecca balsam, mastic, dammar, copal and sandarac.—Arch. d. Pharm., *242*, No. 6 (Aug. 11, 1904), 462–475.

Phloroglucin Trimethylether—Products of Reaction with Nitric Acid.—C. Mannich communicates the results of experiments undertaken with the object of establishing the precise characters and composition of the remarkable blue coloring substance produced by the action of nitric acid upon phloroglucin trimethylether. This was first obtained by Jul. Jobst and O. Hesse, by heating the ether with concentrated nitric acid, in the form of crystalline leaflets of a coppery lustre, which dissolved in water, alcohol, and concentrated hydrochloric and nitric acids with a royal blue color, and subsequently also by W. Will, in a similar manner. Owing to the ease with which this coloring matter undergoes decomposition, however, its precise composition and characters have not been determined, Jobst and Hesse regarding it to be a nitrited quinone, $C_{18}H_{20}(NO_2)_2O_6$, to which they gave the name "dinitrocoton," while Will regarded it to be the nitrate of a colorless, though unidentified base. Subsequently Hesse retracted his view that the blue coloring body is a nitrited quinone, regarding it as being "hexamethyl dinitrophloroglucin" and a derivative of "diphloroglucin" ($C_{12}H_{10}O_6$). The experiments of Mannich, however, confirm Will's supposition that this remarkable coloring body is a saline compound of nitric acid with a base, but not, as supposed by Will, with a colorless base, but with a base having a deep red color, to which he assigns the formula $C_{18}H_{21}NO_6$. If diluted nitric acid is poured on phloro-

glucin trimethylether, a magnificent blue color is developed. If the mixture is then heated to 50°–60° C., the deep blue color is discharged and replaced by a red-violet. On cooling well-defined crystals are deposited, which, after purification have the melting-point 249°C., and prove to be *dimethyl-quinone*, $C_8H_8O_4$, and the end product of the reaction. Under proper manipulation, however, it is quite possible to obtain the

Blue Coloring Body in well-developed crystals. For this purpose, 4 Cc. of 33 per cent. nitric acid are heated on a watch glass, 0.5 Gm. of phloroglucintrimethyl ether added, and heated a few moments until the ether has melted. The glass is then immediately removed from the water-bath and the mixture stirred vigorously with a glass rod until crystallization begins. After cooling the crystals are separated on a suction filter, washed with water and rapidly dried without heat in a vacuum exsiccator. If the heating is prolonged, and the manipulation not sufficiently rapid, a portion of the product consists of dimethylquinone; hence it is advised by the author to operate on not more than 0.5 Gm. at a time, the reaction being so rapid that ten portions can be converted into the blue coloring body within one hour. The yield is 0.55 Gm. The product is soluble in water, alcohol, acetone, benzol, acetic ether and chloroform, forming blue solution; insoluble in petroleum ether and tetrachloride of carbon. The solutions are extremely unstable; aqueous solutions are discolored after a short time, and almost instantaneously if heated to boiling, dimethoxyquinone being deposited. Besides this no other solid product of decomposition is formed. By the action of alcoholic potassa upon the blue coloring body, the red base is obtainable if the product of the reaction is immediately precipitated with water; but if it is exposed to the action of the alkali for several days, a second colorless base is obtained, this having a composition approximating to the formula $C_{17}H_{21}NO_6$. Both bases, and the method of their preparation, are described.—Arch. d. Pharm., *242*, No. 7 (Oct. 11, 1904), 501–512.

Glycerin—Reducing Action on Copper Sulphate.—Joseph L. Mayer having observed that a deposit of cuprous oxide formed spontaneously in Haines' modification of Fehling's Solution, has made experiments which prove that this reducing action is due to the glycerin, and that it is impossible to obtain a glycerin of English and American manufacture that will not reduce Fehling's Solution in the cold after standing at least twelve hours. The presence of the glycerin in the copper solution, before the addition of the potassa solution, does not render the copper solution unfit for use, however, the reduction taking place after the addition of the alkali and the expiration of twelve hours or more. The author therefore recommends admixtures of the glycerin-water-copper-solution with the alkaline solution, immediately before making the test for sugar in the sample of urine to be tested, following in other respects the direction of Prof. Haines.—Merck's Rep., June, 1905, 165.

Glycerin—Direct Method of Estimation.—A. Shukoff and J. Schestakoff propose a direct method for the estimation of glycerin, which is dependent on its solubility in acetone and the difference in the respective boiling-points. Alkaline solutions containing glycerin are first rendered faintly acid, filtered, and then made faintly alkaline with potash ; while acid liquids are also rendered faintly alkaline with potash. The free solution is concentrated, by careful evaporation, at or below 80° C., to the consistence of syrup, or, if salts are separated, even to pasty consistence. A quantity estimated to contain not more than 1 Gm. of glycerin, is then mixed with 20 Gm. of calcined and powdered sodium sulphate, which produce a nearly dry mass. This is then extracted in a Soxhlet apparatus, which must be constructed throughout of glass, because rubber and cork are strongly attacked by acetone, and extracted for about four hours with acetone, previously dried by shaking with calcined potash and subsequent distillation. The acetone solution of glycerin is then subjected to distillation, and the residual glycerin dried to constant weight in an extraction flask, at 75°-80° C., an operation consuming about four to five hours. If, before drying, small drops of oily matter should appear on the surface of the glycerin, these may be removed by rinsing with low-boiling petroleum-ether. The method yields ash-free glycerin of 99 per cent. purity.—Pharm. Ztg., *50*, No. 18 (March 4, 1905), 188 ; from Ztschr. f. angew. Chem., 1905, No. 8.

Nitroglycerin—Assay and Qualitative Test—After studying the different methods proposed for the assay of nitroglycerin, F. W. Moore and L. E. Sayre find the one suggested by the late Dr. Charles Rice to be the best. This consists of the saponification of nitroglycerin by means of alcoholic potash solution and estimating the percentage of nitroglycerin by the amount of alkali required for the purpose. Dr. Rice found that by using alcoholic potash, saponification took place rapidly in the cold, and instantly if the alcoholic potash had been previously warmed. To decompose one molecule of nitroglycerin are required three molecules of potash as follows :

$$C_3H_5(NO_3)_3+3KOH=C_3H_5(OH)_3+3KNO_3.$$

It should be stated that there are other decomposition products, but none of these have any influence on the titer required in the assay. Each molecule of KOH corresponds to one-third molecule or 75.5267 parts of nitroglycerin. Hence each Cc. of decinormal KOH solution containing 0.005599 Gm. of KOH corresponds to 0.00755267 Gm. of nitroglycerin.

A delicate qualitative test for nitroglycerin may be made as follows : Extract the liquid with ether or chloroform, mix the extract with two or three drops of aniline on a watch-glass and evaporate on a water-bath. A few drops of concentrated sulphuric acid are then added, and if nitroglycerin be present, a purple coloration changing to dark-green on dilution with

water will appear. In this way $\frac{1}{1000}$ of a grain may be identified.—Drugg. Circ., October, 1904, 218.

Glycerophosphates—Test of Quality.—The following method for determining the absence of free phosphoric acid and free glycerin is suggested in J. D. Riedel's Berichten, 1905: The cold prepared aqueous solution should not give a precipitate on addition of ammonium molybdate in excess. Shaking the salts with absolute alcohol, then filtering and evaporating the filtrate, should not yield a residue containing glycerin. In other directions, such as the presence of sulphate, chloride, barium, etc., the glycerophosphates, in 5 per cent. solution, are tested in the usual way, including also tests for heavy metals, except in the case of the iron salt.—Pharm. Ztg., *50*, No. 16 (Febr. 25, 1905), 166.

Glycerophosphates of Piperazine—Preparation and Characters.—A. Astruc describes two glycerophosphates of piperazine, the one acid, the other neutral, which are considered as possibly proving useful as therapeutic agents.

Acid Glycerophosphate of Piperazine is obtained as an amorphous transparent mass, slowly but completely soluble in water, by evaporating an aqueous solution of two molecular weights of glycerophosphoric acid and one molecular weight of the base. Its aqueous solutions are neutral to helianthin and acid to phenolphthalein, the latter indicator requiring three molecular equivalents of alkali for neutralization.

Neutral Glycerophosphate of Piperazine may either be obtained by evaporating to dryness equimolecular equivalents in aqueous solution, by precipitating the same solution with alcohol, or by mixing alcoholic solutions of the acid and base, made with alcohol 90 to 95 per cent. The last method is preferable, since the product is a distinctly crystalline precipitate, while that obtained by the other processes is amorphous. It crystallizes in brilliant scales, which melt at about 155° C., with decomposition. It is soluble in water in all proportions, insoluble in absolute alcohol, and almost insoluble in alcohol 90 per cent. It has an acid reaction to phenolphthalein but is alkaline to methyl-orange, a molecular equivalent of a base being required for a neutral reaction with the first indicator and a similar quantity of acid with the second.—Pharm. Journ., May 13, 1905, 693; from Compt. rend., *140* (1905), 727.

FIXED OILS.

Beta-Stearin—A New Body from Beet-root Juice.—A. Ruempler finds that after the removal of sugar and albumin from beet-root juice, the extract contains an unsaponifiable body having the formula $C_{26}H_{44}O$, which, differing markedly from the hitherto recorded cholesterols, it is proposed to name beta-stearin. It is obtained by extracting the sugar from dry beet-pulp with alcohol; exhausting the alcoholic residue with ether, sa-

ponifying the ether extract with alcoholic potash, and crystallizing the non-saponified portion from ether-alcohol. Thus obtained beta-stearin occurs in dendritic and stellate crystals melting at 112.9° C. It is optically inactive, sparingly soluble in alcohol, readily so in chloroform, ether, carbon disulphide, and other organic solvents. It gives a dark blue color-reaction when heated with ferric chloride, hydrochloric acid, and chloroform. When shaken, in chloroformic solution, with strong sulphuric acid, it colors the solvent violet-red, and the acid blood-red with a green fluorescence. Its solution in acetic anhydride is colored deep violet-blue with strong sulphuric acid, and the acid layer is brownish-red with a faint green fluorescence.—Pharm. Journ., Dec. 3, 1904, 815; from Berichte, 1904.

Lactucone—A New Body Extracted from Lactuca Germanica.—C. Pomerarz and F. Sperling state that on extracting *Lactuca germanica* with petroleum ether and concentrating the extract, yellow granular crystals were obtained, which on recrystallizing from alcohol were obtained as white, odorless, and tasteless needles; insoluble in water, soluble in most organic solvents. They had the formula, $C_{23}H_{36}O_2$, and have been named lactucone; they melt at 184° C., and have the $[a]_D$ 50°. On saponification with dilute alkalies lactucone affords lactucol, $C_{21}H_{34}O$; in white needles, m. p. 154.5° C.; lactucone is therefore the acetic acid ester of lactucol; the latter is converted back into lactucone by acetylising. Lactucone combines with two atoms of bromine, forming the additive compound $C_{23}H_{36}O_2Br_2$. It is probable that the lactucone molecule contains a benzene nucleus.—Pharm. Journ., Jan. 7, 1905, 14; from Monatsh. f. Chem., through Chem. Centralbl., 1904, II, 1137.

Lupeol—Occurrence in the Bark of Roucheria Griffithiana, Planch.—J. Sack and B. Tollens have examined Roucheria bark, which is used by the natives of Malacca as a constituent of arrow poison, and have isolated from it, in addition to glucose, a crystalline body belonging to the cholesterin group, which is presumably identical with the lupeol described by Schulze and Lidiernik (Berichte, 24, 183 [1891]), and that found by Romburgh (Berichte, 37, 3440 [1904]) occurring in the form of a cinnamic acid ester in gutta percha. Unlike the lupeol described by these authors, however, it gives a dibromide instead of a monobromide and no acetyl derivative.—Pharm. Journ., Jan. 7, 1905, 14; from Berichte, *37* (1904), 4105.

Fats—Reaction with Phloroglucin.—Dr. Max Winckel in continuation and extension of his researches on the color reactions of *phloroglucin* (which see) finds that the red color which had been regarded as characteristic of vanillin in the presence of HCl, but since shown by him to be produced with other aldehydes as well, is also produced when phloroglucin and HCl are brought in contact with fats that have been exposed to the action of sun-light. The reaction is due to free oleic acid, but the fat need not

necessarily be rancid. Indeed, fats that have become rancid in the dark contain no free oleic acid and do not afford the reaction. This observation points out a marked distinction between fats that have become rancid in the dark and such that have acquired rancidity during exposure to sunlight.—Pharm. Ztg., 49, No. 77 (Sept. 24, 1904), 815.

Solid Fats and Wax—Methods of Specific Gravity Determinations.—Bakurin recommends the following method for determining the specific gravity of wax and solid fats:—The solid is cut into pieces about the size of beans and immersed in alcohol of 70–90 per cent. probably for the purpose of avoiding subsequent formation of air-bubbles—and the liquid is then transferred to an accurately graduated vessel, and this with its liquid content accurately weighed. Then 1–2 Gm. of the solid under examination is introduced into the vessel, and this, with closed stopper, is again weighed. The difference between the two weights and the accurately observed volume of the solid fat, after the necessary corrections, gives the specific gravity with an accuracy, which is sufficient for most practical purposes.—Pharm. Ztg., *50*, No. 17 (Mar. 1, 1905), 178; from Chem. Ztg., 1905, No. 11.

Human Fat—Composition.—The paucity of information concerning the character and composition of human fat in the literature has induced L. Derlin to publish a comprehensive review of the investigations that have heretofore been made and particularly of the exhaustive researches of Dr. H. Jaeckle, communicated to "Hoppe Seyler's Zeitschr. f. Physiol. Chem." (vol. 36). From these researches it appears that human fat is not distinguished in its chemical composition from the fat of the other higher mammals. Besides, traces of lower, volatile fatty acids, human fat is composed of the simple glycerides of oleic, palmitic and stearic acids, oleic acids (69.6–81.6 per cent.) largely preponderating, next palmitic and then stearic acid—the relative proproportions of these fluctuating between 3 : 1 and 5 : 1. The presense of unsaponifiable constituents (cholesterin) and of lecithin has also been established. The consistence of the fat of an adult, at 15° C., was thick-liquid, partly solid; sp. g. 0.9179; color, decided yellow; refractive power at 40° C., 50.6; saponification number, 197.3; R.–M. number, 0.25; iodine number, 63.7; acid number, 0.39; oleic acid, 70.9 per cent.; free acid (as oleic acid), 0.196 per cent.; palmitic acid, 18.5 per cent.; stearic acid, 6.2 per cent.; P_2O_5, 0.0074 per cent.; lecithin, 0.084 per cent; unsaponifiable constituents (crude cholesterin), 0.3203 per cent.; pure cholesterin, 0.2442. The fat of a child 3 days old was solid, pure white, contained only 52.7 per cent. of oleic acid (= 55.0 per cent. olein), and differed otherwise essentially only in the R.–M. number (= 3.4), the iodine number (= 47.3) and the percentage of free acid (0.362 per cent.). The average constants observed in the fat obtained from the subcutaneous tissues of seven adults were as follows:

Saponification number, between	193 and 199.9.
R. M. number,	0.25 and 0.55.
Iodine number,	6.25 and 73.3.
Acid number,	0.22 and 0.4.
Oleine,	72.7 and 85.2 per cent.
Oleic acid,	69.6 and 81.6 per cent.

The author also reviews the researches of numerous investigations (nineteen are mentioned in a bibliography appended) concerning the physiological and pathological significance and processes of fat formation in the human body.—Pharm. Ztg., *49*. No. 76 (Sept. 21, 1904), 805–807.

Lard—Method of Preparation and Preservation.—W. A. Hall observes that by anticipating your wants and with a little trouble, a supply of strictly pure lard may easily be secured. Save your ether cans and in the fall obtain from your butcher some unrendered leaf lard from large hogs. Render this at home in the old-fashioned style, unless, of course, you have facilities in the shop, and fill and cork the cans reserved. When wanted for use you can melt the lard on the water-bath. He has kept lard perfectly sweet and with no sign of granulation, in this way, for over two years. The ointments made from it will likewise keep much better.—Pharm. Era, Dec. 15, 1904, 605; from Proc. Mich. Pharm. Assoc., 1904.

Lard—Cotton Oil Reaction in the Natural Product.—A. D. Emmett and H. S. Grindley have made some interesting observations concerning four samples of lard taken from pigs that had been fed with considerable quantities of cotton-seed meal. These all give the following reactions for vegetable oils: (1) Welman's reaction, (2) Tollen's pentosan reaction, (3) Salkowski's cholesterin reaction, (4) crystals resembling phytosterin. They also give the following reactions for cotton-seed oil: (1) The Bechi test, (2) the nitric acid test, (3) the Halphen reactions. A lard prepared at the same time from a pig not fed on cotton-seed meal gave none of these reactions. Hence it is evident that these lards contain a vegetable oil and three distinct constituents of cotton-seed oil, so it is safe to say that at least a part of the oil in the meal is absorbed by the animal body and transmitted in its unaltered condition to the fat cells.—Journ. Amer. Chem. Soc., *27* (1905), 263.

Lard—Detection of Coco-nut Fat.—According to F. Morrschoeck, the admixture of coco-nut fat with lard may be detected by shaking out the melted fat with alcohol at 45° C. By this treatment a portion of the fat is dissolved, which in the case of pure lard has a positive refraction + 2.8 to + 3.4; an iodine absorption of 69.13 to 70.11, and a saponification value of 192 to 194.1. In the presence of a small quantity of coco-nut fat this alcohol soluble portion has a negative refraction, a lowered iodine value, and an increased saponification value. Thus the addition of 5 per cent. of coco-nut fat to lard gives an alcohol soluble fraction at 45° C., having the refraction—0.1, iodine value, 56.93; and saponification value,

206.6.—Pharm. Centralh., *45*, No. 33 (Aug. 18, 1904), 636; from Ztschr. f. Untersuch. d. Nahr. u. Genussm., 1904, 586.

Coco-nut Fat—Critical Review of Methods for its Detection in Butter.—Dr. Adalbert Segin mention that in addition to the older method, depending on the determination of the Reichert-Meissel acid number, the Hübl iodine number, and the Köttstorfer saponification number, respectively, a number of methods have in recent years been proposed for the detection of coco-nut fat in butter, among which the following have been subjected by him to critical review. Three of these methods, Reychler's, Wauter's, and Vandam's, depend on the determination of the water-soluble and water-insoluble volatile acids contained in the sample, and are based upon the fact that the proportions of the water-insoluble volatile acids in coco-nut fat are much greater in coco-nut oil than in butter, composing only 10 per cent. of total acidity of the butter, whilst in coconut fat they amount to 65 per cent. and in tallow or oleomargarine 45 per cent. of the total volatile acids. These three methods differ mainly in the manipulation. Another method is that of Mercier, who finds elements of distinction in the crystalline form of the glycerides of the butter and of the coco-nut fat; while a fifth method is that of Bömer dependent on the amount of nonsaponifiable substance—crude cholesterin or phytosterin—remaining after saponification, which is shaken out by ether, crystallized from absolute alcohol, etc. Confining his experiments to the determination of the water-soluble and insoluble volatile fat acids and following the manifestation and manipulation of Vandam, parallel experiments were made by the methods of Reichert-Meissel, Hübl and Köttstorfer upon identical mixtures of butter and coconut fat, in proportions ranging from 10 to 50 per cent. of the latter of the mixture. The results show that by Vandam's method it becomes possible to detect with certainty an addition of coconut fat to butter of 30 per cent. and upward, but that the results obtained by the other three methods are not uniformly reliable. But even with Vandam's method it becomes impracticable to distinguish with certainty between pure butter and butter containing the relatively large addition of 10 per cent and 20 per cent. of coconut fat, and the method is therefore not available. More recently two methods have been published which seem to be more promising than any of those previously proposed. The first of these, proposed by Juckenack and Pasternack, is based on the observation that a close relationship exists between the Reichert-Meissel number and the saponification number. If 200 is deducted from the ascertained saponification number, a figure is obtained which in the case of butter fluctuates between + 4.25 and —3.50 from the Reichert-Meissel number, whereas in the case of coconut fat the difference amounts to about —47. The second promising method, which, moreover has the partial endorsement of Juckenack, and Pasternack is proposed by Pollenske, and is based on: *a*, the determination of the Reichert-Meissel number; *b*, the determination of what the author designates as the

"new butter number"; *c*, the determination of the state of aggregation of the undissolved volatile fatty acids floating on the surface of the distillate 15° C. Briefly stated.

Pollenske's Method is carried out as follows: The sample is saponified with glycerin-soda solution, 90 Cc. of water are added, the saponified fat decomposed with sulphuric acid, and the mixture subjected to distillation so that 110 Cc. of distillate shall collect within 19–21 minutes. The distillate is allowed to cool in a bath at 15° C., and the oily layer floating on the surface examined. If this oily layer consists of more or less congealable drops, the sample of butter is adulterated to the amount of 10 or more per cent.; if the oily layer is fluid and non-congealable under the conditions of the test, the butter is pure. The distillate is now mixed, filtered, and the Reichert-Meissel number determined in the known manner. The "butter number" is then determined by washing the condenser, receiver and (filter? Rep.) with neutral 90 per cent. alcohol in three portions of 15 Cc. each, and titrating the united alcoholic liquids with $\frac{N}{10}$ $Ba(OH)_2$, the number of cubic centimeters of this reagent consumed giving the new butter number, and corresponding to the Reichert-Meissel number. Experiments have determined that the addition of 10 per cent. coconut fat to butter, increase this number by 1.0, 15 per cent. by 1.6, and 20 per cent. by 2.1; and in this way it becomes possible to approximately determine the amount of coconut oil in adulterated butter.—Arch. d. Pharm., *242*, No. 6 (Aug. 11. 1904), 441–450.

Fixed Oil of Mustard—Properties and Uses.—A. Rohrbach observes that the expressed oil of mustard is now produced on an industrial scale in Germany and has been found particularly useful as a lubricant. The purified oil has long been valued in Russia as one of the finest food oils. As now produced it will doubtless prove useful in pharmacy. Maçon, who calls attention to its suitability for cosmetic purposes, such as toilet creams, and for preparing hair oils, brillantine, etc., describes this purified oil as being thin liquid, of a yellow color, transparent and clear, becoming faintly turbid at—9° C. and strongly so at—11° C. Its sp. gr. at 15° C. is 0.916; its acidity extremely small—0.062 per cent. calculated as sulphuric acid. It is not resinifiable (non-drying) and is readily soluble in mineral oils.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 819.

Olive Oil—Cotton-Oil Reaction Due to Small Percentages of Kapok Oil.—Examination of high grade table oils in the analytical department of a large manufacturing establishment, by Willard Graham during the past year (1903–1904) proved them all to be of excellent quality, and of the cheaper grade, all were pure, with the exception of two shipments representing 20 barrels. Both of these gave a decided reaction for cotton-seed oil by Halphen's test. Having been rejected on this account, information was received from one of the producers that the oil had been shipped in barrels which had previously contained

Cappock Oil, probably better known as "kapok oil," an oil obtained from the seeds of *Eriodendron anfractuosum*, and used in soap-making as a substitute for cottonseed oil. This oil, it was stated, was capable of producing the Halphen color-reaction, if present even in minute quantities, a statement which is supported by the fact that a sample of cappock oil, imported for the purpose, was capable of producing the red-coloration when 0.5 per cent. or more was added to pure olive oil.—Proc. Penna. Pharm. Assoc., 1904, 130.

Palm Oil—Detection of Oleomargarine.—Palm oil, which has been used as a coloring-agent in oleomargarine, and cannot be detected by the ordinary tests, may, according to C. A. Crampton and F. D. Simons, be detected in quantities of as little as 0.5 per cent., or even less, by the following tests: (1) 100 Cc. of the fat are dissolved in 300 Cc. of petroleum ether and shaken out with 50 Cc. of 0.5 per cent. potassium hydroxide. The aqueous layer is separated, acidified, and shaken with 10 Cc. of carbon tetrachloride. To part of the latter is added 2 Cc. of a mixture of 1 part of crystallized phenol and 1 part of carbon tetrachloride, and then 5 Cc. of hydrobromic acid (s. g., 1.19). On mixing, a bluish-green color indicates palm oil. (2) 10 Cc. of the melted and filtered fat are shaken with an equal volume of acetic anhydride, then one drop of sulphuric acid (s. g. 1.53) is added and the mixture shaken. On settling, the lower layers are colored blue with a tint of green in the presence of palm oil. The reagents must be chemically pure and absolutely colorless, and the sample should not be heated above 70° C., nor for a long time. Sesame oil and mustard oil give a somewhat similar color, but they will be in larger quantities, if present, and may be detected by other tests.—Journ. Amer. Chem. Soc., *27* (1905), 270.

Oleum Ricini—Physical Constants.—L. Myddelton Nash observes that castor oil is one of the many substances which require revision in the B. P., the only physical constant given being the sp. gr., the range of which (0.950–0.970) is considerably too wide. He has determined the constants of twenty-one parcels of the last three season's oil, with the following results:

Specific Gravity at 15. 5/15.5° C.: maximum 0.9640, minimum 0.9626, mean 0.9635. In my opinion the limits 0.958-0.966 would be sufficiently wide.

Acidity.—A limit should also be placed on the amount of free fatty acids allowed. The twenty-one samples examined contained: maximum 1.7 per cent., minimum 0.5, mean 0.95 (expressed oleic acid). Only five samples contained over 1 per cent., and I consider 1.5 should be the maximum allowed.

The *Optical Rotation and Refractive Index* of this oil are very constant, the following figures being typical:

	Sample No. 1.	Sample No. 2
Specific gravity	0.9634	0.9627
Acidity	1.15 per cent.	1.0 per cent.
Rotation in 100-Mm. tube	4°30′	4°30′
Refractive index n_D at 20° C.	1.4785	1.4786

These tests might therefore also be included in the next edition of the B. P.—Chem. & Drugg., Dec. 24, 1904, 1023.

CARBOHYDRATES.

Starch Indicator—Preservation wtth Oil of Cassia.—Frank X. Moerk finds that the starch indicator for volumetric purposes may be well-preserved by the addition of a little oil of cassia, 2 Cc. of the oil being added to a liter of the cooled starch solution made otherwise in the usual manner. In his experience such a solution could then be used up to the last drop when made in the quantity named.—Proc. Penna. Pharm. Assoc., 1904, 95.

Gums—Nitrogen Uniformly a Constituent.—A. B. Stevens publishes the results of some researches made to ascertain the general characters and constituents of gums and particularly of the enzymes found in them. He arrives at the conclusion that all gums contain nitrogen, either in combination or in intimate association, and that all true soluble gums possess in a greater or less degree the properties of enzymes. By comparing the strength of the pyrrol reaction with the activity of the enzyme, it appears that the activity of the enzyme in gum varies in proportion to the amount of nitrogen present; that if enzymes and gums are two distinct substances, there is at present no known method of separation; and that since gums or the acids prepared from them cannot be obtained entirely free from nitrogen, it follows that previous elementary analysis must be verified. It is possible that in some cases the amount of nitrogen present has been so small that it has not materially affected the relation of carbon, hydrogen and oxygen.—Am. Journ. Pharm., June, 1905, 255–260.

Anageissus Gum—Advantages Over Gum Acacia.—A. Goris and G. Lefévre call attention to the advantages that the gum obtained from *Anageissus pendula* possesses over acacia gum. Like ordinary ghatti gum from *A. latifolia*, it gives a much more viscous solution than acacia; it is free from oxydases, and therefore in some cases preferable to acacia for pharmaceutical use. It dissolves slowly in cold water, which, however, is preferable to hot water, as the latter renders part of the gum insoluble.—Pharm. Journ., Oct. 29, 1904, 609; from Bull. des Sc. Pharm., 6, 17.

Apricot Gum—Characters and Composition.—Lemeland describes the gum of the apricot tree as consisting of amber-colored pieces, the size of a nut or plum, often lighter in color and occasionally even translucent, and having a shining, conchoidal fracture. It contains 16.2 to 16.5 per cent. of moisture, 2.85 per cent. of ash, yields 76.6 per cent. of its weight to

water, and contains in 100 parts of 66.176 reducible gum, of which 38.866 is arabinose and 19.80 galactose. It also contains a third carbohydrate, the identity of which remains to be established. The presence of an oxydase could not be determined with certainty.—Pharm. Ztg., *50*, No. 47 (June 14, 1905), 498; from Journ. de Pharm. et Chim., 1905, 443.

Olivile—Properties and Constitution.—Koerner and Vanzetti have investigated olivile, $C_{20}H_{24}O_7$, first isolated by Pelletier from olive tree gum. It has the property of forming molecular crystalline compounds with most of its solvents, such as water, and the primary and secondary alcohols. From these it may be obtained in the anhydrous condition by heating to 130° C. in a current of carbon dioxide. Recrystallized from acetone, it melts at 142.5° C. It contains two methoxyl groups, and two free phenolic hydroxyl molecules. The latter may be methylated. The methyl ester gives a mixture of veratric, veratryl-formic, and oxalic acids when oxidized by permanganate. It appears to be formed by the union of two molecules of coniferic alcohol with an atom of oxygen. When boiled with water and acetic acid olivile is converted into iso-olivile, which shows a dextro-rotation, whereas olivile itself is lævo-rotatory.—Pharm. Journ., Dec. 24, 1904, 929; from Pharm. Centralh., 44, 334.

Sugar—Use of Sodium Monosulphide as Indicator in Determinations.—L. Beulaygue suggests a new method for determining the end reaction when titrating sugar solution in the usual manner with Fehling's reagent, using solution of sodium monosulphide as the indicator. When the end of the reaction is near, a little of the hot solution is applied, by means of a glass rod, to two superimposed white filter papers. The upper one acts as a filter, retaining the particles of cuprous oxide. The lower paper is withdrawn, and the moist spot touched with a drop of the sodium monosulphide reagent, when an immediate black stain of cupric sulphide is formed if the reaction is not complete. By successive spotting out and testing in this manner, a very accurate reading of the end reaction may be obtained. It is important, when standardizing the Fehling's Solution, that the same indicator should be employed. Potassium ferrocyanide in a solution, acidified by either hydrochloric or acetic acid, may be employed in a similar manner. The end reaction is then indicated by the disappearance of the red color from the last spot.—Pharm. Journ., Nov. 26, 1904, 773; from Compt. rend., *138*, 51.

Sugar—Simple and Expeditious Method of Determination with Fehling's Solution.—Francis P. Lavalle, directing attention to the difficulty frequently encountered in determinating the end of the reaction by titration of urine and other liquids containing sugar, with Fehling's Solution recommends the following manipulation which he finds very satisfactory and quite simple: Into a porcelain dish holding 200 Cc. place 5 or 10 Cc. of Fehling's Solution, 30 Cc. of caustic soda (1 :3), and 50 or 60 Cc. distilled water, heat it, and when the fluid begins to boil gradually add

some of the solution of sugar. The operation is finished as soon as the last drop causes the blue color of the Fehling's Solution to disappear.—Chem. News, June 30, 1905, 299.

Sugar—Accurate Test for its Presence in Urine.—The editor of the Journal of the American Medical Association recommends the fermentation test for the presence of sugar in the urine as the safest and most reliable of all. To apply it, one needs three fermentation tubes and some good compressed yeast. A lump of yeast the size of a hazlenut (0.5 to 1 gram) is rubbed up in a small mortar with one or two cubic centimeters of water, and this suspension is mixed with about 25 Cc. of urine (acidified with a few drops of a solution of tartaric acid). An Einhorn fermentation tube or some similar apparatus is carefully filled with the mixture and the whole set aside in a warm place for from twelve to twenty-four hours ; if sugar is present it will be converted into alcohol and carbonic acid gas and the latter will accumulate in the upper part of the fermentation tube. To make sure that the yeast itself does not contain starch or sugar, a second fermentation tube is filled with water (acidified with tartaric acid) and yeast and to prove further that the yeast is active, a third tube is filled with an acidified one per cent. solution of grape-sugar and yeast. No gas (or only a minimal amount) should appear in the second tube at the end of twelve hours, while the third tube should contain an abundance of CO_2. By means of this simple test all the members of the group of reducing substances other than sugar are excluded, for they do not ferment with yeast. Levulose and maltose do ferment with yeast, but they are only very rarely present in urine, while glucose is very often present. Glucose is moreover, strongly dextrorotary to polarized light, while levulose is strongly lævorotary: and, again, if levulose is present the urine should yield Seliwanoff's reaction for ketoses (test with resorcin and hydrochloric acid). If the fermentation test, carried out as above recommended, be positive, then the practitioner may be reasonably sure that he is dealing with glycosuria, and, if he wish to make assurance doubly sure, he may exclude the presence of levulose by the methods mentioned.—Pharm. Era, Dec. 22, 1904, 632.

Milk Sugar—Preparation.—Under a Swedish patent, milk sugar is prepared as follows: The precipitated whey, freed from curd, is boiled, the separated albuminous matter skimmed off, until it is reduced to about one-fourth of its original volume. It is now filtered and the filtrate again boiled down to a quarter of its volume. It is now a thick syrupy liquid, which is set aside to crystallize. The sugar is separated from the liquid by the centrifugal apparatus. The sugar is then dissolved in a suitable quantity of water, and 1 per cent. by weight, of bone-charcoal, ground up finely, and one-fifth of 1 per cent. acetic acid are added, and the whole heated to about 90° C. (224° F.). Heat is increased until the mass commences to boil, when about 2 per cent. of magnesium sulphate is added. Boiling is

continued for a few minutes longer, when the liquid is filtered, and to the filtrate a small amount of alum and bone-charcoal is added. It is again filtered, after which the mass is concentrated by boiling, and the liquid set aside to crystallize out. The sugar is obtained by the centrifugal apparatus.—Nat. Drugg., Jan., 1905, 6.

Milk Sugar and Maltose—Characteristic Reaction.—A. Wöhlk finds that if 0.5 Gm. of milk sugar is dissolved in 10 Cc. of ammonia and heated 15–20 minutes on a steam-bath, so that the ammonia may be driven off, with avoidance of boiling, however, the liquid will assume a madder red color. Under the same conditions this color is also produced by maltose, but not by any other carbohydrate.—Pharm. Ztg., *50*, No. 9 (Feb. 1, 1905), 92; from Ztschr. f. anal. Chem., *43*, No. 11 (1904).

Aloinose—A Sugar Formed from Barbaloin by Age.—Leger has observed that barbaloin and isobarbaloin moistened with 90 per cent. alcohol and kept for a long time in well closed vessels, lose their bitter taste and form an amorphous sugar, which, however, yields an osazone having a microscopically crystalline structure. The author's observations were made with aloins which had been kept in the condition explained for ten years.—Pharm. Ztg., *49*, No. 73 (Sept. 10, 1904), 771; from Bull. Commerc., 1904, No. 7.

Mannamine—A Product of Reduction from Mannose.—According to E. Roux a new base, mannamine (amino-1-hexanepentol) is obtained in form of oxalate, by treating mannose with hydroxylamine. Mannamine closely resembles glucamine in its general properties. It forms a colorless mass of crystalline structure. It melts at about 139° C., is very soluble in water, and has a very caustic saccharine taste. The neutral oxalate $(C_6H_{13}O_5NH_2)_2C_2O_4H_2$, is very soluble in water, insoluble in absolute alcohol, and crystallizes from alcohol (60 per cent.) in lozenge-shaped tablets, melting at 186° C. On heating this forms dimannoxamide, in small hexagonal lamellæ, melting at 218°–219° C.—Pharm. Journ., Sept. 3, 1904, 380; from Compt. rend., *138*, 505.

Sorbierite—A New Sugar in Mountain Ash Berries.—G. Bertrand finds that in addition to sorbite, the juice of the berries of the mountain ash—*Pyrus aucuparia*—contains another isomeric sugar, which he has named sorbierite. It has the composition $C_6H_{14}O_6$, and remains in the mother-liquor after separating the sorbite. It occurs in clinorhombic anhydrous prisms, which are extremely soluble in water, deliquescing when exposed to the air, and melting at 75° C. Sorbierite is lævorotary, $(a)_D$—3° 42′. It gives a characteristic hexacetic ester, crystallizing in hexagonal scales, m. pt. 123° C., and having the $(a)_D$—26° 66′ at 18° C. in chloroformic solution. It forms two acetals with benzaldehyde and sulphuric acid; one fairly soluble in boiling alcohol, m. pt. 192° C., the dibenzoic acetal; the other, tribenzoic acetal much less soluble, and melting at about 240° C.—Pharm. Journ., Jan. 14, 1905, 38; from Compt. rend., 1904, 139, 802.

ORGANIC ACIDS.

Organic Acids—New Method of Esterification.—A. Werner and W. Seybold have found that the alkali salts of organic acids react in aqueous solution with dimethylsulphate, giving the methyl ester of the corresponding acid according to the equation—$R.COOK + (CH_3)_2SO_4 = R.COOCH_3 + CH_3K.SO_4$. The method is carried out as follows: Five Gm. of the acid are dissolved in a slight excess of normal caustic potash and shaken vigorously for about half an hour with two molecular proportions of dimethyl sulphate; the excess of this latter reagent is destroyed by heating the mixture for another half hour on the water-bath. Any free acid is removed by addition of excess of caustic potash, the ester being obtained by filtration if a solid, or by steam distillation if liquid. Treated in this way 5 Gm. acetic acid gave 3 Gm. methyl ester; 5 Gm. stearic acid gave 4 Gm. ester; 2-4-6 tribromo-benzoic acid gave a 45.7 per cent. yield of ester.—Pharm. Journ., Dec. 24, 1904, 930; from Berichte, *37*, (1904) 3653.

Referring to the above method of esterifying organic acid by means of dimethyl sulphate, Hans Meyer states that the method is not new, but was employed so long back as 1835 by Dumas and Peligot, and that both he and Wegescheider have at various time published papers dealing with the use of this method.—Pharm. Journ., Dec. 31, 1904, 957; from Berichte, *37*, (1904) 4144.

In support of the use of dimethyl sulphate for the esterification of organic acids, Hans von Liebig states that he has been able to obtain by its means the three possible methylderivatives of dihydroxitriphenyl acetic acid—$(C_6H_5)_2C_6H_3(OH)_2$. C. COOH—which substance resisted all attempts at esterification by other means.—Pharm. Journ., Dec. 31, 1904, 957; from Berichte, *37*, (1904) 4036.

Volatile Acids—Distribution and Formation in Plants.—The studies of E. Charabot and A. Hébert show that the greatest amount of free volatile acids is invariably found in the leaves of various plants, such as peppermint, basil, various oranges, and other species yielding volatile oils; the least occurs in the inflorescences until drying up of the plant commences, then free volatile acid is found in the lowest amount in the stem. The relative proportion in the different organs increases and decreases simultaneously, becoming less at the period of the formation of the inflorescence, particularly in the leaves, and increasing as the flowers expand, to finally diminish when the plant dries up. Etiolated plants show a decidedly greater proportion of volatile acid, calculated on the dry material, in all their organs than similar plants grown exposed to light. The proportion of combined acids is also greater in the leaves than in the stem. In examining the ash of various organs it is found that soluble carbonates, and especially that derived from organic salts of potassium, are chiefly found in the ash of the stem. The least proportion of soluble carbonates exists in the inflorescent ash. The ash of the leaves affords the highest

proportion of insoluble carbonates derived from organic salts of magnesium and calcium. Etiolated plants show an exaggerated amount of combined acids, but the suppression of the inflorescences reduces the amount.—Pharm. Journ., Dec. 31, 1904, 958; from Bull. Soc. Chim. (3), *31* (1904), 1107.

Oxalic Acid—New Synthesis.—H. Moissan has previously shown that absolutely dry carbon dioxide has no action on potassium hydride between the temperatures — 85° and + 54° C., but that if only a trace of moisture be present, combination takes place instantly. Above + 54° C. the dry gas begins to unite with hydride, forming potassium formate, thus, $CO_2 + KH = KCHO_2$. When, however, the temperature is raised to between 100° or 200° C. a quantity of oxalate is formed as well as formate, $2KH + 2CO_2 = K_2C_2O_4 + H_2$. Great heat is developed during the combination. The amount of oxalate indicated by analytical methods is confirmed by the gasometric determination of the hydrogen produced, according to the above equation.—Pharm. Journ., June 10, 1905, 845; from Compt. rend., *140*, 1209.

Formic Acid—Characteristic Reaction with Sodium Bisulphite.—E. Comanducci proposes a test for the presence of formic acid which is dependent on the yellow color produced on adding sodium bisulphite to its solutions. If 2.5 Cc. of the liquid to be tested—formalin methyl alcohol, glycerin, acetic acid, etc.—be diluted with an equal volume of water, and 15 drops a concentrated solution of sodium sulphite (1 Gm. in 1 Cc. distilled water) added, the mixture then shaken and heated, a yellow-red color is developed in the presence of formic acid.—Pharm. Ztg., *49*, No. 89 (Nov. 5, 1904), 947; from Rend. della R. Acad. delle Sc. di Napoli, through Chem. Centralbl. 1904, II, No. 16.

Lead Acetate—A Crystalline Compound with Lead Sulphate.—P. Lemoult finds that when a dilute solution of sodium thiosulphate is added to a solution of lead acetate, a white precipitate of lead thiosulphate is formed. If acetic acid is then added, this precipitate disappears more or less completely according to the concentration of the original mixture. If the conditions are favorable for complete solution of the precipitate, and the whole left for a little time, a compound in the form of very heavy fine white needles separates out. These are sometimes 3 or 4 Mm. long. An analysis of this compound proves it to have the formula $2S_2O_3Pb(CH_3—CO_2)_2Pb$.—Chem. News, Sept. 23, 1904, 160; from Compt. rend. *139*, No. 7, Aug. 16, 1904.

Acidum Benzoicum, Pharm. Germ., IV.—Difficulty to Differentiate from Skillfully Prepared Substitutes.—According to the Pharm. Germ., iv., benzoic acid is of official quality only if prepared by sublimation from Siam benzoin. This, as is well known, is far more expensive than is Sumatra benzoin, and consequently the acid prepared from Siam benzoin is corre-

spondingly more expensive, while artificial benzoic acid prepared from toluene, is very much less expensive than that prepared from either kind of benzoin. Calling attention to these facts, M. Lefeldt states that it is quite possible to manipulate toluene-benzoic acid, by subliming it with more or less benzoin, so that it is impossible to distinguish it by the pharmacopœial tests from the official acid. The test principally relied upon for the detection of toluene-benzoic acid is that for chlorine; but the presence of a small trace of chlorine, such as is evidenced by *faint opalescence*, is permitted as a natural or unavoidable constituent of the official acid. Experimentally, the author has proven that toluene-benzoic acid invariably contains small percentages of chlorine ranging from 0.082 per cent. to 0.244 per cent. With toluene-benzoic acid containing the smaller percentages of chlorine, it is quite possible to prepare fraudulent acids that, containing a considerable percentage of the artificial acid, will fail to show more than "faint opalescence" under the conditions of the test, and will otherwise conform in all respects to the tests given for the true acid. Thus, by mixing 20 Gm. of toluene-benzoic acid with 30 Gm. of benzoin containing 8 per cent. of benzoic acd, and subjecting the mixture to sublimation, the resultant benzoic acid responded in all respects to the tests of the Pharm. Germ., iv. The author concludes that the only safeguard consists in the preparation of the acid by the pharmacist himself from Siam benzoin direct. This presents no difficulties, and is readily accomplished by the aid of the simple and inexpensive subliming apparatus described in text-books.—Pharm. Ztg., *49*, No. 67 (August 20, 1904), 703.

Saccharin—Improved Test.—Schmidt's reaction for the detection of saccharin (which constitutes the B. P. test) consists in fusing with potassium hydroxide, whereby the SO_2 group is replaced by hydroxyl, forming potassium salicylate, which, as a phenol derivative, gives a blue coloration with ferric chloride. Mahler finds that this apparently simple reaction is, however, somewhat difficult to carry out, the slighest overheating in the fusion destroying any salicylate produced; moreover, as a test, it presupposes the absence of salicylic acid in the substance under investigation. The following test is not inferior to Schmidt's, whilst it is easy to carry out. It is based on the fact that when metallic sodium is fused with organic bodies containing sulphur, sodium sulphide is produced. The substance to be analyzed is extracted with ether, and the ethereal solution evaporated to dryness. The residue is then placed in a tube with a small piece of metallic sodium and heated until it burns and is carbonized. The hot tube is then plunged into a freshly-prepared solution of sodium nitro-prusside. A red-violet coloration may be considered certain evidence of the presence of saccharin in the original substance, since the ethereal solution can contain no other sulphur compound.—Pharm. Journ., Feb. 18, 1905, 235; from Chem. Ztg., *29*, 32.

Lactic Acid—Volatility with Steam.—Conflicting statements having

been made from time to time regarding the volatility of lactic acid with steam, F. Utz has taken up the subject and finds that lactic acid is certainly volatile with steam to an extent which increases with the strength of the acid, but the distillation is never quantitative unless superheated steam be employed as described by Partheil.—Pharm. Journ., May 27, 1905, 789; from Chem. Ztg., *27* (1905), 363.

Lithium Citrate—Incorrect B. P. Statement of Water Content.—D. B. Dott calls attention to the fact that the official (B. P.) statement as to the properties of water lost when lithium citrate is heated just under 100° C. is quite incorrect. This is stated to be 19 per cent. but he finds that crystallized lithium citrate, obtained by cooling a strong solution of the salt, loses 24. 7 per cent. near 100° C., corresponding to about four molecules.—Pharm. Journ., Mar. 25, 1905, 440.

Lithium Citrate—Water of Hydration.—Supplementary to the above note, Mr. Dodd states that it is impossible to drive off the last of the water of hydration in an air-bath without some decomposition of the salt. His experiment would seem to indicate that an air-dry salt has the composition $C_6H_5Li_3O_7 \cdot 5H_2O$, and that four molecules of water are removed by exposure in a bath at 100° C. or slightly under—this being equal to 24.0 per cent.—Ibid., April 15, 1905, 550.

Cream of Tartar—Qualitative Determination of Very Small Quantities of Lead.—J. Gadais recommends the following practicable, but somewhat circumstantial method for the qualitative determination of very small quantities of lead in cream of tartar: 100 Gm. of the sample are dissolved in 60 Cc. of hydrochloric acid (sp. gr. 1.175) and 80 Cc. of water; then 60 Cc. of water and cupric nitrate corresponding to 0.15 Gm. of Cu are added, the solution is treated with H_2S. The precipitate is collected after standing 12 to 24 hours, dissolved in nitric acid, the solution filtered, evaporated to 25 Cc., diluted to 50 Cc., and subjected to electrolysis in a platinum capsule for 12 hours. The capsule is then well washed, first with water, then with alcohol, and finally with ether. On now dropping 3 to 4 drops of a solution of acetate of tetramethyl-diaminodiphenyl-methane into the capsule, an intense blue color is developed, if the sample contained as little as 0.1 milligram of lead in form of PbO_2.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 473; from Chem. Centralbl., 1905, I, No. 17.

Tartar Emetic—Test for Potassium Bitartrate.—Instead of the test for the presence of potassium bitartrate in tartar emetic, depending on the effervescence produced if sodium carbonate is added to its solution, N. Schoorl proposes $\frac{N}{10}$ Hyposulphite solution. This, when added to an equal volume of a saturated solution of tartar emetic forms a mixture that remains clear for at least 5 minutes, whereas in the presence of potassium bitartrate an immediate turbidity and precipitation of sulphur results.—Pharm. Ztg., *49*, No. 88 (Nov. 2, 1904), 938.

Chromous Tartrate—Preparation.—G. Baugé obtains chromous tartrate in form of micsoscopic crystals, as follows: Moist chromous acetate is treated in an atmosphere of carbonic acid with a cold solution of tartaric acid; the vessel containing the blue solution formed is placed in a boiling salt bath, a current of carbonic acid through the vessel being maintained. A blue precipitate is formed rapidly, and aqueous vapor, with acetic acid, are volatilized. When precipitation is complete, the precipitate is collected by aspiration, the inert atmosphere being maintained, and when the mother liquors have been removed, is washed with water saturated with carbonic acid, until the cotton filter-pad is colorless. The water is then removed by successive washing with 90 per cent. alcohol, absolute alcohol, and ether, and is finally dried in a current of carbonic acid on the water bath and stored in tubes filled with the same gas. The microscopic crystals of pure chromous tartrate so obtained form a pale-blue powder, and have the composition $C_4H_4CrO_6$. It is insoluble in water free from air, but rapidly oxidizes in the air, becoming green; this change occurs in ordinary water containing air more slowly, a clear violet solution being formed.— Pharm. Journ., Sept. 3, 1904, 379; from Comp. rend. *138*, 1217.

Salicylic Acid—Sensitive Test.—Merl finds that the characteristic color reaction for salicylic acid may be obtained as follows: Small strips of filter paper, previously moistened with very dilute ferric chloride solution are partially inserted into the ether and petroleum ether mixture which has been used to shake out the acid. In the presence of salicylic acid, the ends of the strips not inserted in the liquid show zones of the characteristic violet color.—Pharm Journ., Aug. 27, 1904, 335; from Pharm. Post.

Salicylic Acid—Determination in Foodstuffs.—F. T. Harry and W. R. Mumery observe that the colorimetric determination of small quantities of salicylic acid presents difficulties in the examination of foodstuffs when tannic acid is present, and in the following method take advantage of the insolubility of lead tannate and the solubility of lead salicylate in caustic alkalies: 50 Gm. of the sample is mixed with a little water, 15 Cc. or 20 Cc. of strong solution of lead subacetate added, and then 25 Cc. of roughly normal soda. With this 15 Cc. to 20 Cc. of roughly normal hydrochloric acid is mixed, and the whole made up to 300 Cc.; 200 Cc. is filtered off, acidified with hydrochloric acid, refiltered, if necessary, extracted three times with ether, and the salicylic acid determined in the usual way. Different samples require different treatment with regard to the quantity of lead subacetate and alkali to be used, which can be judged by practice.—Pharm. Journ., June 3, 1905, 821; from Analyst, *30* (1905), 124.

Salicylic Acid—Ferric Compounds.—L. Rosenthaler finds that the statement in the literature, that the violet solution obtained by adding ferric

chloride to an aqueous solution of salicylic acid is not decolorized by shaking with ether or chloroform, is correct only under certain limitations. A single shaking does not remove the color from the solution, but continued perforation with ether will effect it completely. The violet color changes to red, and this to brown, and the solution no longer contains salicylic acid provided that sufficient ferric chloride has been used in the first instance. If the brown liquid be submitted to dialysis until chloride can no longer be detected, a brown flocculent precipitate is produced, and the liquid becomes quite colorless. Other compounds of iron with organic substances exhibit a similar behavior. The red color which succeeds the violet is due to the formation of a basic ferric salicylate; it is observable only when the proportion of hydrogen ions is small. As the latter increase, the color changes to violet. Perforation with ether removes salicylic acid, and therefore diminishes the proportion of hydrogen ions, and the red color appears, but can be changed into violet by the addition of any acid, or even sodium salicylate.—Arch. d. Pharm., *242*, No. 8 (Nov. 30, 1904), 563–566.

Salicylarsinate of Mercury—Characters and Uses.—Mercuric salicylarsinate is produced by the interaction of methylarsinic acid and basic mercuric salicylate. It is a white, amorphous salt, sparingly soluble in water, but may be sterilized in such solution without decomposition; does not give the reactions either of arsinate nor of mercury; contains 14.4 per cent. of arsenic and 38.46 per cent. of mercury; and is therapeutically employed in syphilis in form of subcutaneous injections, which are said to be painless.—Pharm. Ztg., *50*, No. 33 (April 25, 1905), 352; from Bull. des Soc. Pharm., 1905, No. 3.

Dinitro-Aminophenol (Picramic Acid)—Expeditious Method of Preparation.—According to A. Frébault and J. Aloy, picramic acid may be more expeditiously prepared by the following method than by that of Girard. A hot solution of picric acid in water or methyl alcohol is treated with zinc dust and sufficient solution of ammonia to give a distinct alkaline reaction. On boiling, an intense red color is developed; ebullition is continued for an hour, the alkalinity of the liquid being maintained by the occasional addition of ammonia; the boiling solution is then filtered and evaporated to dryness, a slight excess of acetic acid being added after all the ammonia has been driven off. The residue is redissolved in boiling water, filtered and crystallized. Fine pomegranate-red crystals of picramic acid, m. p., 165° C., are thus obtained. It does not detonate, like picric acid, when suddenly heated, nor does it precipitate albuminoids or alkaloids. With alkalies it gives salts of a fine red color, changing to a pale greenish tint in the presence of excess of acid, so that these salts may be used as indicators in alkalimetry.—Pharm. Journ., Mov. 12, 1904, 706; from Journ. de Pharm. et de Chim. (*6*), 20. 245.

Coumaric Acids—Their Sodium Salts as Therapeutic Agents.—In a course of a series of clinical investigations carried out by Dr. Lovell Drage with glycerinum sodii cinnamatis, a demand arose for a drug having a more pronounced action when administered hypodermatically, in consequence of which Gilbert T. Morgan was led to consider in what way the physiological activity of cinnamic acid might be enhanced. The employment of benzene derivatives as therapeutic agents has amply demonstrated the fact that the presence of an amino (NH_2) or a hydroxy (OH) group in the aromatic nucleus greatly increases the physiological action of the parent hydrocarbon, and it therefore seemed likely that the use of a substituted cinnamic acid containing one of these groups might bring about the desired effect. Since the application of amino-compounds of the anti-febrin type is often attended by unpleasant secondary effects, the author was in the first place led to employ a hydroxy-derivative, and to recommend the use of sodium ortho-coumarate, a substance having the structure of cinnamic acid with a hydroxyl (OH) substituent. For hypodermic injections the author proposes a 22 per cent. aqueous solution of

Sodium Ortho-Coumarate containing a slight excess of free ortho-coumaric acid. The dichroic solution is quite limpid and stable, and as the salt is excessively soluble in cold water even a higher concentration may be employed if required. In all the cases hitherto studied the solution has produced a rapid physiological action, the leucocytosis being well marked, and resembling that produced by the cinnamate. Experiments have also been instituted on the sodium salts of the two isomeric coumaric acids with the view of ascertaining whether the change in the relative positions of the active groups brings about any appreciable difference in the physiological action.

Sodium Para-Coumarate prepared by the Perkin-Fittig synthesis from para-hydroxybenzaldehyde is a much less soluble salt than the ortho-compound, and accordingly an 8 per cent. aqueous solution was employed. The results obtained with equivalent quantities seemed to show that the action was of a similar nature, but rather less intense than that produced by the ortho-salt.

Sodium Meta-Coumarate, which was prepared synthetically from meta-nitrobenzaldehyde, was employed in a 20 per cent. solution; this had a very marked physiological action, being apparently even more active than that prepared from the ortho-compound.—Pharm. Journ., June 3, 1905, 816.

Tyrosine.—Occurence in the fruits of *Sambucus Nigra*, which see under "Materia Medica."

Tannin—Estimation with Ferric Salts under Definite Conditions.—The German Commission for the Unification of the Methods for the Estimation of Tannin in 1883 adopted officially the Loewenthal-von Schroeder process. This process consists of determining the difference of the oxidizing

power between the raw solution and the solution filtered through powdered skin. Now powdered skin absorbs a considerable amount of coloring matter which acts on permanganate. The amount of cameleon used is not, therefore, in proportion to the real amount of fixed tannin. M. Ruoss now proposes to precipitate the tannin by means of a ferric salt under definite conditions. A tannate of iron is formed of constant composition; the amount of tannin it contains is deduced from the weight of oxide of iron obtained on calcination. *Reagents.*—(1) Solution of crystallized carbonate of soda (71.36 per thousand); (2) solution of ferric sulphate at 50 grms. per liter; (3) solution of 5 grms. of tartrate of soda in 1 liter of acetic acid at 30 per cent. The method of working is as follows: Fifty Cc. of a solution of tannin (about 4 grms. per liter) are treated with 10 Cc. of carbonate of soda and 10 Cc. of ferric solution, then with 25 Cc. of acetic tartrate of soda. Boil, filter, and wash with warm water. The precipitate is dried and calcined; the sesquioxide of iron is weighed. The weight found, multiplied by 4.024, gives the proportion of tannin in the 50 Cc. taken.—Chem. News, Sept. 16, 1904, 149; from Zeit. Anal. Chem., xii, 717.

Tannic Acid—Valuation by means of Formaldehyde.—C. Glücksmann suggests a method for the valuation of commercial tannins which is based upon the observation made by E. Merck in 1895 that tannin in the presence of hydrochloric acid forms an insoluble compound (tannoform). The test is carried out by dissolving 2 Gm. of the tannin in the smallest practicable quantity of water, adding 30 Cc. of strong hydrochloric acid and 15 Cc. of formaldehyde solution, and evaporating the mixture on a water-bath, with stirring, to about 15 Cc. The residue is then mixed with 250 Cc. of distilled water, the precipitate is collected in a Gooch, asbestos-lined filter, washed with distilled water, and dried to constant weight at not exceeding 95° C. The theoretical yield from pure tannin should be 101.8 per cent., but this yield is not attainable from commercial tannins, notwithstanding that the possible presence of phloroglucin or pyrogallol—indicated by the colors developed in some sorts of commercial tannin by the process—serve to increase the theoretical percentage. Nevertheless, a minimum of 95 per cent. should be demanded.—Pharm. Ztg., *49*, No. 72 (Sept. 7, 1904), 758; from Pharm. Post, 1904, No. 31.

Tannoform—Proposed Pharmacopœial Tests.—The following tests of purity and identification of tannoform have been proposed for the forthcoming supplement to the Dutch Pharm.: Soluble in ammonia with a brown color, in sodium-hydrate with a red color. If 0.1 Gm. of tannogen in 10 Cc. of water and 2–3 drops of diluted hydrochloric acid are digested together a few minutes, the filtrate is colored green on addition of a few drops of ferric chloride, and dark-brown if more is added. If the filtrate is heated with silver nitrate and ammonia, reduction results with dark coloration. The filtrate obtained after shaking 1 p. tannoform with 100

p. of water for 5 minutes, should be neutral or at most faintly acid, and should after the addition of nitric acid give no turbidity with barium nitrate or with silver nitrate. On incineration, tannoform should leave only traces of incombustible matter.—Pharm. Ztg., *50*, No. 9 (Febr. 1, 1905), 90; from Pharm. Weekbl., 1904, No. 50.

Tannin Albuminates—Preparation and Pharmacologic Value.—The former researches of L. Lewin having shown that tannic acid, when given in form of alkaline tannates, is excreted by the kidneys as tannic acid, and that the alkaline tannates do not coagulate albumin, this form has been found a good way of giving the drug. Furthermore, the fact that tannin has a great affinity for albumin led Lewin to suggest giving it in the form of an albuminate, so that the irritation of the gastric wall might be prevented. The albuminate which he introduced many years ago is made by adding to a 2 to 5 in 150 solution of tannic acid the white of one egg dissolved. This albumin is well divided in water, and will not damage the tissue with which it comes into contact. That there is any especial advantage in the more modern compounds of tannic acid and albumin he will not admit. Lewin states that all albuminates of tannin act equally, and points out that any one is free to prescribe the formula which he has found so useful, especially when given for a long time in nephritic conditions.—Pharm. Journ., July 9, 1904, 43; from Deutsch. Med. Woch., 1904.

Methylo-Tannin — Preparation and Characters. — J. Herzig and R. Tscherne obtained a methylated tannin, which they designate as "methylotannin," by treating 10 Gm. of tannin, suspended in absolute alcohol, with an ethereal solution of diazomethane. The excess of diazomethane was removed by distillation, the syrupy residue dissolved in benzene, and the product obtained from this dissolved in hot absolute alcohol. This on cooling deposits the methylo-tannin in form of a white, amorphous powder, m. p. 124°–126° C., to the amount of 60–65 per cent. of the tannin employed. Methylo-tannin is optically dextrorotatory, and has a composition agreeing with the formula $C_{24}H_8O_7(OCH_3)_8$ or $C_{25}H_{10}O_7(OCH_3)_8$. —Pharm. Ztg., *50*, No. 45 (June 7, 1905), 475; from Ber. d. D. Chem. Ger., 1905, 989.

Tannins and Tannoids—Reaction with Vanillin and Hydrochloric Acid. —See *Phloroglucin* under "Alcohols."

Catechins—Variation According to Source.—A. G. Perkin has already pointed out that whereas *Gambier catechu* contains a catechin, $C_{15}H_{14}O_6$ (m. p. 175–177° C.), the pentabenzoyl derivative of which melts at 151–153° C., yet a catechin, $C_{15}H_{14}O_6$, which was isolated from *Acacia catechu* melted at 204–205° C., and gave a benzoyl compound, melting at 181–183° C. It is now found that the acacia catechin gives an acetyl derivative, $C_{15}H_9O_6(C_2H_3O)_5$, forming colorless needles (m. p. 158–160° C.), and a tetramethyl ether, $C_{15}H_{10}O_2(OCH_3)_4$, separating in colorless prisms

(m. p. 152–153° C.). The corresponding substances from the Gambier catechin, according to Kostanecki and Tambor (Ber., 1902, 35, 1867), melt at 129–130° C. and at 142–143° C., respectively. For acacia catechin the name "*acacatechin*" is proposed.—Pharm. Journ., July 9, 1904, 43; from Proc. Chem. Soc., *20*, 171.

Bismuthoprotocatechuic Acid—Chemical Formula.—Paul Thibault has prepared a well-crystallized bismuthoprotocatechuic acid having the formula $C_7H_5O_5Bi$, by the direct treatment of protocatechuic acid with pure hydrated oxide of bismuth; he has also obtained a few other derivatives of this acid, its sodium, potassium, and ammonium salts and its anilides The preparation of these compounds has enabled him to determine the formula which should be given to this compound.—Chem. News, Nov. 11., 1904, 244; from Bull. Soc. Chim., (3), *31*, No. 4.

ORGANIC BASES.

Alkaloids—Localization in Plants.—Professor L. Errera has commuuicated to the British Association of Science an interesting paper on the micro-chemical methods by which alkaloids may be located in plants. According to the results it appears that the qualitative and, to some extent, the quantitative distribution of alkaloids (and especially those belonging to the pyridic series) can be determined micro-chemically in the various organs of the plant with certainty. In living cells the alkaloids are eliminated from the protoplasm and gather in the vacuole, and it is only in cells which have lost all their liquid contents (as in ripe seeds) or in dead cells that they accumulate in the protoplasm or the cell wall. The alkaloids are generally found to be localized. In very active tissues they occur chiefly in the neighborhood of growing points and in the ovules. In the epidermis the alkaloids are commonly found in the epidermic hairs, and often also in the sub-epidermic layers of vegetative organs as well as in the outer layers of fruits and seeds. In certain of their phloëm elements and in the neighborhood of the pericycle, alkaloids occur encircling the fibro-vascular bundles. They are found also in the phallogen and the youngest cork cells and in laticiferous or similar elements when present. The micro-chemical method has brought to light many more alkaloid-bearing plants, and it is suggested that the application of the method to animal tissue would reveal the existence of organic bases. According to Professor Errera, the results of study seem to show that alkaloids are waste products resulting from the katabolism of cytoplasm, and secondarily employed for defense against attack by animals. A few grains of alkaloid constitute a protection not less efficient, he remarks, than the strongest spines.—Pharm. Journ., Sept. 3, 1904, 380; from Lancet, *167*, 630.

Alkaloidal Assay—Reviews for the Year 1904.—Professor W. A. Puckner interestingly reviews the literature on the estimation of alkaloids for the year 1904, embracing general methods (criticism of Panchaud's and Kel-

ler's methods by E. Beuttner and by G. Fromme) and the method specially applicable to aconite, the mydriatic drugs and cinchona, discussed by Fromme, Beuttner, Frostberg, Leger, Overton, Warin, Paul and Howard, and Matolscy. This review cannot be profitably condensed and must therefore be consulted in the original, in Pharm. Review, June 1905, 175–181.

Aconitine—Revision of Chemical Formula.—The investigations of H. Schulze have re-opened the question of the chemical formula of aconitine, which was the subject of controversy of German and English chemists during the year 1894 and 1895, W. R. Dunstan maintaining the correctness of the formula $C_{33}H_{45}NO_{12}$, which differed from one previously given by Wright only a plus of 2 atoms of hydrogen, whilst by M. Freund and T. Beck insisted on the formula $C_{34}H_{47}NO_{11}$. Operating with pure aconitine, m. p. 197°–198° C., Schulze has obtained analytical figures which prove to his satisfaction the fallacy of Dunstan's formula, which requires more carbon than could be found by the analysis. The values found approximate closely to the formula of Freund and Beck, but are nearer to the formula $C_{34}H_{45}NO_{11}$, which is distinguished by a minus of atoms of hydrogen, and which had on a former occasion been considered by Freund.—Apoth. Ztg., *19*, No. 79 (Oct. 1, 1904), 782.

Aconitine—A New and Characteristic Reaction.—Dr. Eugenio Pinerna Alvarez, having assured himself of the identity and purity of a specimen of aconitine, and having determined the lack of chemical reagents which allow the confirmation of the presence of aconitine by characteristic reactions, investigated numerous reactions according to different plans, and finally obtained results which appear to establish a new and characteristic reaction for determining the identity of this base. Varying quantities (0.0005 to 0.0002 Gm.) of the alkaloid were submitted, in a little porcelain crucible, to the action of 5 to 10 drops of pure bromine, slightly heating the mixture in a salt water bath to encourage the reaction. Then 1 to 2 Cc. of fuming nitric acid was immediately added, and evaporated to dryness in the same bath, adding a little more bromine when the acid lost its color, this forming an oxidation product of yellow color. Then 0.5 to 1.0 Cc. of a saturated alcoholic solution of KOH, using pure alcohol (D = 0.796) for its preparation, was added, and the mixture evaporated to dryness. A mass of a red or brown color—more or less intense, according to the quantity of aconitine—is obtained. The dish is allowed to cool, and then 5 to 6 drops of an aqueous 10 per cent. solution of cuprous sulphate are dropped into the dish, when, having well moistened the inner surface of the latter with the copper solution, the latter assumes a very deep green color.—Chem. News, April 20, 1905, 180.

Aporeine—A New Papaveracea Alkaloid.—V. Pavesi has obtained from the dried-seed capsules of *Papaver dubium*, from plants not perfectly ripe,

0.05 per cent. of a new alkaloid which he names aporeine. The hydrochloride forms crystalline scales, m. p., 230° C., which are soluble in water, and give preciptates with phosphomylybdic acid, silver nitrate, etc.—Pharm. Ztg.. *50*, No. 27 (April 5, 1905), 282; from Chem. Centralhl., 1905, i, No. 11.

Codeine—Properties.—K. W. Schulz has reinvestigated the properties of pure codeine with particular reflection on the requirements of the Russian Pharmacopœia. He finds that pure synthetic codeine, obtained from morphine by means of sodium methylsulphate, and having the composition $C_{18}H_{21}NO_3+H_2O$, requires 118 p. of water at 15° C., for solution instead of 80 p.; that it loses its water of crystallization (=5.68 per cent.) at the temperature of the water-bath, and at the higher temperature of 120° C., required by the Pharmacopœia, the loss (6.15 to 6.40 per cent.), indicates partial decomposition. The alkaloid responds correctly to the official color-reaction with sulphuric acid and nitric acid, viz., production of a colorless solution with sulphuric acid, changed to blood-red on addition to nitric acid. The presence of traces of selenium or of iron in the sulpuric acid, however, gives rise to green-blueish coloration, instead of a colorless solution, and this reaction is sufficiently delicate to warrant its utilization for ascertaining the purity of sulphuric acid, which is to be used for making color-reactions, and particularly in such that are required for the identification of opium alkaloids.—Pharm. Ztg., *49*, 73 (September 10, 1904), 770; from Farmaz. Journ., 1904, *43*, 789.

Diacetylmorphine Hydrochloride—Characters.—D. B. Dott observes that among the acetyl derivatives of morphine, which were first prepared by Beckett and Wright, the diacetyl compound, known by the name of "heroin," enjoys considerable favor, and is probably the best known. The hydrochloride is the salt in general use. This salt melts at 117° C. (or near it). It is readily soluble in water, about 1 in 10. 0.4 Gm. dissolved in 4 Cc. water and 0.1 Gm. sodium bicarbonate added yields, after several hours a precipitate which when collected on a small filter, washed with 6 Cc. water, and dried in water-baths, weighs 0.3 Gm. This precipitate is easily soluble in chloroform. It melts at (or near) 169° C. The hydrocloride seems to contain two molecules of water, of which one is lost under 100° C., the remaining portion at 120° C. It has not been sufficiently noted that the base and its salts are very easily decomposed. The muriate is not seldom prescribed in mixtures which favour decomposition. Diacetylmorphine is decomposed by excess of alkali and by access of acid; not only by the fixed alkalies, but also by ammonia. Heated with dilute HCl. acetic acid is liberated and morphine again formed.—Pharm. Journ., Mar. 25, 1905, 440.

Ethylmorphine Hydrochloride—A Therapeutic Equivalent of Codeine.—D. B. Dott observes that ethylmorphine hydrochloride, introduced into

medical practice under the name of "dionin," is believed by some persons to possess special value of its own, although its therapeutic efficiency, like its pharmacologic action, is probably almost identical with codeine. Ethylmorphine differs entirely from the diacetyl compound in being a perfectly stable body. The hydrochloride melts at (or near) 124° C. The formula indicates two molecules of water, of which amount one-fourth is lost under 100° C., and the remainder at 120° C. This salt is soluble 1 part in 14 of water; 1 Gm. in Cc. of alcohol (90 per cent). Pharm. Journ., Mar. 15, 1905, 440.

Isotetrahydropapaverine—A New Derivative of Papaverine.—M. Freund and H. Beck have obtained and describe a new derivative of papaverine, having the empirical formula $C_{20}H_{25}NO_4$, for which they propose the name isotetrahydropapaverine. This readily forms a nitroso-derivative, which may be converted into the hydrochloride of the base by alcoholic hydrochloric acid; it also reacts readily with methyl iodide. Papaveraldin sulphate, dissolved in 10 per cent. sulphuric acid, was subjected to a current of 10 amperes between lead electrodes, the temperature being kept at 80°–90° C. At the end of the reaction, which was indicated by a change in color of the solution from brown to light yellow, the base was precipitated out by caustic soda and purified by conversion into its nitroso-derivative, which crystallizes from alcohol and melts at 138° C. The hydriodide of the new base is precipitated from an aqueous solution of the hydrochloride by addition of potassium iodide; it crystallizes from dilute alcohol in small white slabs, which turn yellow and contract at 245° C., and melt fairly sharply at 255° C. The physiological properties of isotetrahydropapaverine hydrochloride are described by Professor Heinz as follows: A 5 per cent. solution dropped into the eye produces complete anæsthesia, but also causes some irritation and reddening of the conjunctiva. It has no narcotic effect upon the frog; but, on the contrary, produces convulsions. The fatal dose for a frog is 5 Mgm. Doses from 10 Mgm. to 100 Mgm. have no narcotic action upon warm-blooded animals, and do not produce any relief against pain, nor have they any retarding effect upon respiration. Doses of 100 Mgm. and upwards produce paralysis but not narcosis.—Pharm. Journ., Nov. 5, 1904, 662; from Berichte, 1904, *37*, 3321.

Brucine—New Color-Reactions.—In the course of a critical review of the older color-reactions of brucine and strychnine, C. Reichard describes several new reactions which are quite characteristic and available for the recognition of brucine. If the well-known brucine-nitric acid reaction is retained, this should be carried out in the cold. The Flückiger reaction with mercurous nitrate is not regarded favorably by the author, but mercuric nitrate affords a characteristic reaction for the identification of brucine. If the latter is brought in contact with mercuric nitrate there is no immediate characteristic reaction; but on evaporating the solution of the two substances a violet deposit, plainly discernable by daylight results,

and remaining so as long as there is moisture present. A more characteristic reaction than with the mercury salts, however, is obtained with the corresponding silver salts. On triturating the dry substances together and moistening the mixture, an immediate reduction results, as also when their solutions are mixed. If the solutions are then evaporated and a drop of stannous chloride is added, a characteristic deep-red color is immediately and quite sharply developed. Cupric nitrate reacts similarly to mercuric nitrate. If a drop of diluted cupric solution is carefully evaporated and a trace of brucine is added, with a drop of water, a violet-blue color is developed on moderate heating, increasing in intensity as water evaporates. The addition of a droplet of stannous chloride on the dry residue then produces a red, then brown-red, and finally yellow-brown, and, if heat is applied, deep violet. Under the same test, strychnine yields on the addition of stannous chloride a light-green color, changing to dark-green on evaporation.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 864; from Chem. Ztg., 1904, No. 77.

Strychnine Cacodylate—Instability and Extemporaneous Preparation.—Attention is drawn in "L'Union Pharm." (1905, No. 3) to the instability of strychnine cacodylate, which has been recommended in the treatment of tuberculosis, to promote the appetite, by subcutaneous injections in doses of 0.002 to 0.02 Gm. per day. In aqueous solutions, strychnine separates rapidly and is deposited, remaining undissolved even in presence of cacodylic acid. It is therefore recommended to prepare the solutions extempore from sodium cacodylate and strychnine sulphate. To obtain 1 part of strychnine cacodylate, 0.37 part of strychnine sulphate and 1.05 parts of sodium cacodylate are required.—Pharm. Ztg., *50*, No. 33 (April 25, 1905), 352.

Cinchona Alkaloids—Reactions with Organic Acid Radicles.—A. B. Lyons records the results of experiments made to determine the behavior of the salts of the several cinchona alkaloids towards the more common organic acid radicles in order to determine the cause of possible incompatibilities. The following salts are included in these investigations: Ammonium acetate, citrate and oxalate; sodium and potassium tartrate; sodium benzoate, borate, phosphate and salicylate; potassium iodide and chromate; resorcin.—Pharm. Rev., Oct., 1904, 365-371.

Cinchona Alkaloids—Dibromo-Addition Compounds.—The investigations of Christensen confirm the correctness of the supposition of Koenigs and Comstock that cinchonine dibromide consists of two isomerides. Furthermore it is shown that both isomerides (α and β) yield the same monobromo-substitution product of the original alkaloid by loss of one molecule of hydrogen bromide, and the same product (dehydrocinchonine, or cinchonidine) by loss of two molecules of hydrogen bromide. *α-Cinchonidine dibromide* crystallizes from alcohol in large rhombic plates, melt-

ing at about 225°C. It is optically inactive. *β-Cinchonidine dibromide* crystallizes in long prisms, melting at about 210° C. It is three times as soluble in alcohol as the *a* modification, and rotates the plane of polarization strongly.

Quinine—Concentrated Solutions by the Aid of Boric Acid and Glycerin.—According to Baroni, highly concentrated solution of quinine may be obtained by the aid of boric acid and glycerin as follows:—400 Gm. of freshly precipitated quinine (obtained from 680 Gm. of quinine bisulphate) and 400 Gm. of water are triturated to a paste; 153 Gm. of boric acid and 440 Gm. of pure glycerin (sp. gr. 1.260) are incorporated with this and the mixture is occasionally shaken during 12 hours. A perfect solution is then obtained, which is filtered, and brought to the volume of 1000 Cc. by passing sufficient of a mixture of 25 Gm. of glycerin and 75 Gm. of water through the filter, the solution so obtained is filled in vials of 1 Cc. capacity, securely corked and sterilized during one hour by exposure to a current of steam at 100° C. The solution so obtained contains 0.4 Gm. of alkaloid in the cubic centimeters, but may be diluted to contain 0.3 or 0.2 Gm. by the addition of glycerin and water in the proportion of 25 : 75 or 30 : 70.—Pharm. Ztg., *49*, No. 87 (Oct. 29, 1904), 926; from Ztschr. L. Oslerr, Ap–V., 1904, No. 43.

Quinine and Cinchonine—Distinguishing Tests from Other Alkaloids and from Each Other.—In the course of a study of the reactions of quinine and cinchonine with different metallic salts, ammonium persulphate and potassium bichromate, etc., C. Richard has observed that these bases can be distinguished from other alkaloids by their reaction with concentrated solution of ferric chloride. Quinine and cinchonine are colored red-brown by solution of ferric chloride, the color changing to green on touching the product of the reaction with sulphuric acid. They may be distinguished from each other by the aid of a solution of ammonium molybdate in sulphuric acid. Quinine acquires a light-blue color, subsequently changing to dark blue, while cinchonine at once takes the dark-blue color.—Pharm. Ztg., *50*, No. 30 (April 15, 1905), 314.

Quinine and Quinidine—Color Reactions.—Ballandier finds that if a few cubic centimeters of an acidulated solution of quinine or quinidine are shaken with bromine-vapor, the solutions lose their fluorescence and acquire a yellowish color. If then a drop of cupric sulphate solution be added, followed by ammonia water, drop by drop, the addition of the first drop of the latter gives rise to a peach-blossom red, the second a dark-red, and subsequently violet and green. The green liquid becomes blue to violet on addition of mineral acids, but is again restored to green by alkalies. If, however, 1 or 2 drops of ammonia be added to the original solution after treatment with bromine-vapor, the well-known thalleioquin reaction occurs, but on now adding a drop of cupric sulphate solution, the

liquid assumes an immediate dark-blue color, which is not changed or destroyed by mineral acids. Analogous reactions may be obtained with chlorine if the mineral acids employed are not too concentrated.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 864; from Jour. Pharm. Chim., 1904, xx, No. 4.

Quinine Hydrochloride—Chemistry.—H. Carette finds that by dissolving 1 mol. of quinine in 2 mols. HCl, a hydrochloride containing 2½ mols. of water is obtained. This forms hygroscopic crystals, which are permanent in dry air, but lose a portion of water at 20° C., and become anhydrous at 102° C., assuming a yellow color. A quinine hydrochloride containing 1½ mols. of alcohol is obtained by crystallizing the salt from saturated solution in 95 per cent. of absolute alcohol on evaporation in a vacuum, but on exposure the salt loses the alcohol completely and is converted into a hydrochloride containing 2½ mols. H_2O.—Pharm. Ztg., *49*, No. 88 (Nov. 2, 1904), 939; from Jour. de Pharm. et Chim., 1904, xx, No. 8.

Quinine Sulphate—Tests for the Presence of and Removal of Uncrystallizable Alkaloids.—Martinotti and Castellini find that the presence of uncrystallizable alkaloids in quinine sulphate may be recognized by the property of sodium carbonate to precipitate these contaminants from hot solutions of the salt. Thus, if some sodium carbonate is added to a boiling-hot solution of quinine chloride, the solution becomes decolorized and a black, syrupy to resinous mass of uncrystallizable alkaloids is deposited, if such are present. The removal of the latter in the process of manufacture of quinine sulphate may be accomplished by taking advantage of the fact that during the recrystallization of the quinine salt, the uncrystallizable resin-like alkaloids remain in solution if the latter is neutral or acid; while, after the second or third crystallization, when the uncrystallizable alkaloids have accumulated, advantage may be taken of the fact that the latter are first precipitated on the addition of alkali, forming a viscous magma, easily separable from the remaining quinine salt.—Pharm. Ztg., *49*, No. 88 (Nov. 2, 1904), 939; from Boll. Chim. Farm., 1904, No. 15.

Cocaine—Influence of Heat on its Aqueous Solutions.—Duffour and Ribaut find that the decomposing influence of heat on aqueous solutions of cocaine is not so great as to preclude the sterilization of such solutions. It is necessary, however, to avoid temperatures above 100° C. If the heat is within this limit, the changes are quite insignificant, and need not be considered; amounting in extreme cases only to the conversion of 2.5 per cent. of the cocaine into ecgonine and benzoylecgonine.—Pharm. Ztg., *99*, No. 62 (Aug. 3, 1904), 651: from Bull. Scienc. Pharm., 1904, No. 6.

Cocaine Solutions—Hydrolysis by the Alkalinity of the Glass Container.—Duffour and Ribaut have studied the part played by the alkalinity of the glass vessels, in which solutions of cocaine hydrochloride are sterilized, in

bringing about hydrolysis of the alkaloid. They selected vessels made of three different kinds of glass all in common use in France and of three different degrees of alkalinity. The results showed that at a temperature of 123° C. from 4.6 to 60.0 per cent. of the cocaine (which was present in the form of a 2 per cent. solution) might be hydrolysed, and that the hydrolysis always extended to the production of ecgonine. At a temperature of 99.5° C., however, the proportion of cocaine hydrolysed by the most alkaline glass is much less—viz., 2.5 per cent.—Pharm. Journ., Aug. 27, 1904, 335; from Bull. des Sciences Pharm., 6, 362.

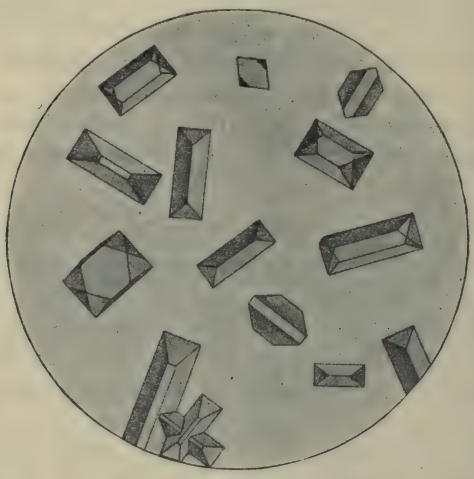
Dihydroberberine—New Series of Basic Derivatives.—Martin Freund and Heinrich Beck find that when berberinal is subjected to the action of Grignard's reagent, *i. e.*, alkylhalogen and magnesium in ethereal solution, the aldehyde group suffers a change, its carbon atom taking part in the formation of a new ring, while the oxygen atom becomes replaced by the alkyl group. The resulting substance is an alkyl substituted dihydroberberine. Thus, by using benzyl chloride, methyl iodide, and bromo-benzene, the corresponding benzyl, methyl and phenyl dihydroberberines have been obtained.—Pharm. Journ., Feb. 4, 1905, 149; from Berichte, *37* (1904), 4673.

Ephedrine—Conversion into Pseudo-Ephedrine.—Nagai having (in 1890) obtained from ephedrine by prolonged heating of the base with hydrochloric acid at 180° C., a new base, melting at 114° C., which he designated as "iso-ephedrine," E. Schmidt had (1892) taken up the investigation with results which pointed out the possible identity of Nagai's iso-ephedrine with the pseudo-ephedrine naturally occuring along with ephedrine (in *ephedra vulgaris*—see Proceedings 1892, 611). Dr. E. Flacher has now re-investigated the subject with results which prove the identity of iso-ephedrine and pseudo-ephedrine. It follows, therefore, that ephedrine is converted by prolonged heating with diluted hydrochloric acid into pseudo-ephedrine, identical in all respects with the natural base.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 380–383.

Oxylupanine—A New Alkaloidal Constituent of the Seeds of Lupinus Perennis.—The investigations concerning the alkaloidal constituents of the different sorts of lupinus seeds undertaken at different periods in recent years by Prof. Ernst Schmidt, with Davis, Gerhard, Berend and Callsen as collaborators, have demonstrated that the alkaloids of the seeds of *Lupinus perennis* consist essentially of *dextro-lupanine*. The chemical nature of the alkaloids of these seeds appears, however, not to be uniformly the same, notwithstanding that no differences were observable in the morphological characters of the commercial seeds or of the plants grown from them. Thus Gerhard found in the seeds of *Lupinus perennis*, examined in 1896, besides large quantities of dextro-lupanine, small quantities of other alkaloids, while Callsen, two years later, was unable to find any alka-

loids other than dextro-lupanine in seeds of the same origin, and indistinguishable in their external characters from those examined by Gerhard. At the suggestion of Professor Schmidt, G. Fr. Bergh has now reinvestigated the seeds of *Lupinus perennis*. He finds that they contain, besides much dextro-lupanine ($C_{15}H_{24}N_2O$), considerable quantities of a new base, resembling dextro-lupanine, but containing 1 molecule more of O, and therefore distinguished as "oxylupanine" ($C_{15}H_{24}N_2O_2$). By a circumstantial process described, 15 Kgm. of the seeds yielded 15 Gm. of the base in the form of large, transparent, perfectly colorless and well-formed rhombic crystals, which when examined under the microscope presented the field shown by Fig. 47, and contains 2 mols. of water of crystallization

FIG. 47.



Crystals of Oxylupanine.

($C_{15}H_{24}N_2O_2 + 2H_2O$). It is readily soluble in water, alcohol, methyl alcohol and hydrous acetone, soluble in anhydrous acetone, chloroform and phenol, very sparingly soluble in cold ether, acetic ether and benzol, and insoluble in bisulphide of carbon and petroleum ether. In chloroformic solution it is spontaneously and quickly converted into hydrochloride. Preserved over sulphuric acid it gradually loses water of crystallization and becomes porcelain-like and opaque. The air-dry substance melts at 76°–77° C. When perfectly dried in a vacuum, at 50°–60° C., it melted at 172°–174° C., but when dried at 100° C., under ordinary pressure, the alkaloid is browned, and then exhibits pronounced hygroscopic properties, which is not the case when it is dried in a vacuum. Oxylupanine is strongly dextro-rotatory. From the same quantity of identical seeds the author obtained 200 Gm. of

Dextro-Lupanine, which he has fully identified with the alkaloid previously described by other investigators. He has also prepared and de-

scribes the hydriodide, sulphocyanide, methyliodide, chloroaurate, and chloro-platinate of this base. Furthermore, experiments made to determine the characters of the second base, described by Gerhard as an oily body, to which he gave the name

Lupanidine, lead the author to the conclusion that Gerhard's lupanidine is simply a mixture of lupanine, oxylupanine, fat and resin. Its sparing solubility in water is attributable to the presence of fat and resin ; its sparing solubility in ether, to the presence of oxylupanine.—Archiv. d. Pharm., *242*, No. 6, (Aug. 11. 1904), 409-440.

Isophysostigmine—Physiological Action.—Professor Ogin has investigated the second base, found by E. Merck in Calabar beans along with physostigmine, and separated from the latter by ether, in which the new base is insoluble. This has been named isophysostigmine, since it appears to have the same chemical formula as physostigmine, and to generally resemble that base. Its sulphate, however, melts at 202° C., whereas physostigmine sulphate melts at 140–142° C. The chloroplatinate of isophysostigmine is immediately thrown down as a crystalline precipitate when 0.5 to 1 per cent. solution of the sulphate is treated with platinic chloride. Physostigmine sulphate, under similar conditions and even with much stronger solutions, gives no precipitate. The physiological action of the two bases is similar, but isophysostigmine is more active, it stimulates peristaltic action in smaller doses, and its myotic effect on the eye is more prompt and more lasting than that of physostigmine, although atropine counteracts this effect more readily with isophysostigmine than with physostigmine. The solutions of salt of isophysostigmine should be kept in non-actinic glass bottles and preserved by the addition of a little boric acid. In potency, 0.75 Mgm. of isophysostigmine is equivalent to 1 Mgm. of physostigmine.—Apoth. Ztg., *19*, No. 90 (Nov. 9, 1904), 891 ; from Therap. d. Gegw., 1904, 492.

Scopolamine Hydrobromide—Determination of the Presence of Apo-Atropine.—According to the experience of Kobert many of the scopolamine preparations of commerce are contaminated to a greater or less extent with "apo-atropine," to which the unpleasant by-effects of scopolamine hydrobromide are attributed. Belonging to the optically inactive solanacea-alkaloids, its presence is best determined by means of the polariscope. Pure scopolamine hydrobromide in 6.5 per cent solution at 15.8° should not show less than $(a)_D = -25°45'$.—Pharm. Ztg., *50*, No. 14, (Feb. 18, 1905), 144 : from Riedel's Ber., 1905.

Skimmianine.—An Alkaloid from *Skimmia Japonica*, Thunb. J. Honda has obtained a basic active principle from *Skimmia Japonica*, Thunb, which he has named skimmianine. The air dried leaves of the plant, on treatment with 90 per cent. alcohol at ordinary temperature, yielded an extract which, after filtering and evaporating, left a thick dark green

residue; the latter treated with warm water and filtered, gave a brown solution, which had a feebly acid reaction and a bitter taste. From this solution, made either acid or alkaline, the active principle may be extracted by shaking with chloroform. After distilling off this solvent the base may be made to crystallize from alcohol in four-sided prisms, melting at 175.5 C.; it is readily soluble in chloroform and in alcohol, fairly soluble in methyl alcohol, very slightly soluble in ether, amyl alcohol, and carbon disulphide and insoluble in water and ligroine. The free base is almost tasteless, whereas its salts are very bitter. Skimmianine is only soluble in excess of dilute mineral acids, forming salts which crystallize out on concentrating the solution. If it is attempted to dissolve these salts in water or alcohol they break up, yielding the free base. Skimmianine does not reduce alkaline copper salts even after boiling with mineral acids. It gives precipitates with all the alkaloidal reagents, potassium mercuric iodide, picric, tannic, and phosphomolybdic acids, and platinic chloride. It dissolves in conc. sulphuric acid to a clear brown-yellow solution, which turns reddish-brown on addition of crystals of potassium chlorate. Fröhde's reagent gives first a green and then a blue color, potassium permanganate in conc. sulphuric acid a violet, changing to yellow-brown. Analysis and molecular weight determinations lead to the formula $C_{32}H_{29}O_9N_3$. For physiological experiments a 5 per cent. solution of the amorphous base was used. It was obtained by extracting with chloroform the aqueous extract of the leaves after making alkaline with sodium carbonate. Injected into *Rana esculenta* is produced local rigor of the muscles, accompanied in larger doses by contraction of the pupil. It exerts a retarding action upon the pulse, probably by acting upon the muscles of the heart.—Pharm. Journ., Feb. 4, 1905, 149; from Arch. f. Exp. Pathol. etc., *52* (1904) 83-84.

Solanine—Products of Hydrolysis.—A. Lieben has determined that the saccharine bodies produced by the hydrolytic splitting up of solanine are galactose, rhamnose, and a complex sugar, which is gradually split up further by continuing hydrolysis. The presence of dextrose in this mixture could not be determined with certainty. The statement that croton aldehyde is one of the products of the hydrolysis of solanine is proven by the author to be erroneous.—Pharm. Ztg., *50*, No. 18 (March 4, 1905), 189; from Œsterr. Chem. Ztg., 1905, No. 3.

J. Wittmann has also studied the products by hydrolysis of solanine, and obtained results which in essentials confirm the above results of Lieben. Furthermore, the formulas of solanine ($C_{52}H_{93}NO_{18}$), and of the products of hydrolysis, solanidine ($C_{40}H_{61}NO_2$), as previously given by Firlas, have also been confirmed by the author.—Ibid., *50*, No. 36 (May 6, 1905), 378; from Monatsh. f. Chem., *24*, No. 4 1905.

Coniine—A New Reaction.—C. Reichard has observed that if a drop of coniine is added to a little powdered cupric sulphate on a white porcelain surface, a deep dark-blue color is developed—immediately—if anhy-

drous salt is employed, after a short time with the ordinary salt. The color perfectly resembles that of a strong ammoniacal copper sulphate solution. The coniine is completely absorbed, forming a dry dark-blue crystalline compound.

Nicotine fails to give this reaction, which can therefore be used for distinguishing the two bases from each other, and particularly in connection with the distinctive reaction of the two bases with palladium chloride, described by the author.—Pharm. Centralh., *46*, No. 13 (March 30, 1905), 252.

Nicotine—Double Salt with Ammonium Molybdate.—In the course of experiments undertaken to determine a reliable method for determining nicotine. Meszlényi observed that solution of ammonium molybdate (preferably 20 per cent.) and nicotine in acid solution (preferably acetic) produce an insoluble double salt, having the composition $(C_{10}H_{14}N_2.H_2MoO_4).(NH_4)_2MoO_4.4MoO_3$, which he terseley designates as "Nicotine-Ammonium Molybdate." The

Determination of Nicotine in Presence of Ammonia therefore requires a special process, which is recommended as follows: 25 Gm. of the substance are triturated with 5 Cc. of diluted potassium hydrate solution and about 15–20 Gm. of calcined gypsum, the mixture is extracted during 12 hours with anhydrous ether, the extract shaken out with 10 Cc. of the purest 15 per cent. hydrochloric acid, and after evaporating the ether from the acid solution, this is dissolved in 96 per cent. alcohol, and precipitated with platinum chloride. The quantity of nicotine is then calculated from the platinum content of the precipitate: 1 equivalent Pt = 1 equivalent nicotine.—Pharm. Ztg., *50*, No. 27 (April 5, 1905), 282; from Chem. Centralbl., 1905, i, No. 12.

Nicotine—New Synthesis.—A. Pictet has succeeded in synthetizing nicotine from nicotinic (β-pyridine carbonic) acid. This is first esterified, then converted into an amide by treatment with ammonia; this amide is transformed into β-amino pyridine by treatment with sodium hypobromate; the mucate of this base, when submitted to dry distillation, yields azopyridylpyrrol, a pale-yellow liquid boiling at 251° C. This is transformed into α-pyridylpyrrol by passing it in the form of vapor through a red-hot glass tube. It is a feebly acid compound, melting at 72° C. With metallic potassium, it forms a salt, by the substitution of a hydrogen atom. When this salt is treated with methyl iodide it gives the iodomethylate, melting at 207° C. When distilled with lime the molecule CH_3I is removed and the isopyridine of Cahours and Etard on the nicotyrine of Blau is formed. When this isopyridine is treated with iodine in alkaline solution it forms a mono-iodo-substitution product melting at 110° C. This, heated with tin and hydrochloric acid yields an isomer of nicoteine, dihydronicotyrine, boiling at 248° C. This body has been found in tobacco. It gives a tetra-bromo-derivative when brominated with an

acetic acid solution of bromine. This, in its turn, when treated with tin and hydrochloric acid, loses all its bromine and forms inactive nicotine, and this, when saturated with an alcoholic solution of dextrorotatory tartaric acid, gives a well-formed crystalline tartrate, having the formula:

$$C_{10}H_{14}N.2C_4H_4O_6.2H_2O,$$

melting at 88° C., and a rotation of + 25° 1′, after repeated crystallizations from boiling alcohol. The base liberated from this salt has all the characters of natural lævorotatory nicotine; boiling at 246°.1 C. at 735 Mm., having the sp. gr. 22°–40°: 1.008 and the $[a]_D$ —161° 19′ at 25.5° C. The syrupy mother-liquors from which this tartrate was separated probably contain dextrorotatory nicotine.—Pharm. Journ., Dec. 3, 1904, 815; from Comptes rend., *137*, 862.

Nicotine.—Determination in *Tobacco*, which see under "Materia Medica."

Nicotine Camphorate—A New Compound.—The "Pharm. Post" (1905, No. 8) gives some preliminary information concerning a compound of nicotine and camphoric acid, which, presumably, will find therapeutic uses. It is obtained by heating the two substances in a flask provided with a reflux condenser, in a sulphuric acid-bath at 250° C., and is practically insoluble in water, but soluble in alcohol, forming a permanently colorless solution; whereas the corresponding solution of pure nicotine darkens rapidly.

Acetanilide—Preparation.—A. Gawalowski communicates the following method of preparing acetanilide, which differs in some particulars from that usually adopted:—3 parts of aniline (aniline oil, Blue oil) and 1 part of the strongest acetic acid, dissolved in water or alcohol, are heated for several hours in a flask provided with a reflux condenser, until a small sample of the reacting mixture, dissolved in water and filtered, no longer produces the well-known yellow color upon wood-fibre paper moistened with it, indicative of unchanged aniline acetate. The mixture is then allowed to cool, mixed with sufficient calcined gypsum (stucco-gypsum) to produce a hard, crumbly mass, and this is then extracted wtth boiling water or hot diluted alcohol, and the filtered extraction evaporated. On cooling, crude acetanilide crystallizes out. This is deprived of mother-liquor by centrifugation, and recrystallized from hot solution—finally again applying the test for unchanged aniline acetate on wood-pulp-paper, which should simply acquire a flesh-colored stain, becoming red-brown when touched with solution of potassium hydrate, a second sample of the purified product should give the yellow-aniline reaction with zinc chloride. If the aniline employed contains phenyl, the crude acetanilide will contain some cumarin. —Pharm. Ztg., *50*, No. 45 (June 7, 1905), 473; from Pharm. Post, 1905, No. 22.

Antipyrine—Volumetric Method of Determination.—P. Lemaire bases a method for its volumetric determination on the fact that antipyrine forms sparingly soluble picrate, molecule for molecule, with acid. A $\frac{N}{20}$ solution of picric acid is set against $\frac{N}{10}$ NaOH solution, using phenolphthalein as indicator. A known volume of the antipyrine solution is treated with a known excess of the standard picric acid reagent, the precipitate formed is filtered out, and the uncombined acid is titrated in the filtrate, using phenolphthalein as indicator. From these data the amount of antipyrine present is calculated. An approximate determination of the amount of free acid left, after precipitation, may be made without titration by matching the color of the filtrate against that of solution of picric acid of known strength.—Pharm. Journ., Jan. 7, 1905, 13; from Repertoire, 1904, *16*, 493.

Antipyrine—Detection in Pyramidon.—The following test is suggested by P. Boureet for detecting as little as 2 per cent. of antipyrine in pyramidon (dimethyl-amidophenyl dimethyl pyrazolon): Dissolve 0.01 Gm. to 0.02 Gm. in 4 or 5 Cc. of cold water in a test-tube, add 2 Cc. of sulphuric acid and 2 drops of a saturated solution of sodium nitrite (or a little of the salt) and shake; pyramidon gives an intense bluish-violet color, which rapidly fades, leaving the solution colorless; if antipyrine is present a stable bluish-green color is perceptible after the bluish-violet, due to the pyramidon, has faded away.—Pharm. Journ., June 10, 1905, 845; from Bull. des Sci. Pharm., 7, 218.

Choline—New Method of Detection.—Choline, which makes its appearance in the blood in certain cases of nerve disease, may be detected by the following new method, suggested by R. W. Allen: Ten to 20 Cc. of freshly-drawn blood is mixed with four to six times the volume of 96 per cent. alcohol, allowed to stand two hours, filtered, and the filtrate evaporated to dryness at 30° to 40° C. The residue is extracted with 3 Cc. of 99.6 per cent. absolute alcohol, filtered, and the filtrate again evaporated to dryness; a third extraction with 1.5 Cc. of absolute alcohol having been made, and the filtrate evaporated to dryness as before, 0.8 Cc. of distilled water is added, the whole well mixed and transferred to a small dialyzer, and dialyzed for twenty-four hours into 4 Cc. of distilled water. The resultant clear aqueous solution thus freed from inorganic salts is then evaporated to dryness in a small porcelain capsule, and to the residue one drop (0.1 Cc.) of distilled water is added and shaken round in the capsule. An approximately saturated solution of iodine is 30 per cent. Alcohol is then carefully added drop by drop; the addition of 5 to 10 drops of the iodine solution results in the production of a reddish-brown precipitate, or coloration, if choline be present, which quickly disappears on standing or on the addition of an excess of the test solution. The blood of persons in good health so treated yields no result, but the addition of 0.001 Gm. of choline to the blood before treatment suffices to produce a distinct reddish-brown coloration, quite distinguishable from the coloration due to

the reagent.—Pharm. Journ., Nov. 5, 1904, 662; from Journ. of Physiology, xxxi, No. 5. Proc. lvi.

Eucaine Lactate—Characters and Uses.—Eucaine lactate is claimed to possess the advantage over the hydrochloride of the base in that it produces local anæsthesia without the secondary effects of hyperæmia or ischæmia. It is recommended by A. Langgeard in the form of 2–3 per cent. solutions in opthalmology and dentistry, in 2–5 per cent. in diseases of the nose and throat, and in 10–15 per cent. solutions for diseases of the ear. Eucaine lactate is described as a white, non-hygroscopic powder, melting at 155° C., readily soluble in less than four times its weight of water, forming a faintly alkaline solution. Alcohol dissolves 13 per cent. of its weight. Compared with the hydrochloride the eucaine content of the lactate is somewhat smaller, 119 Gm. of the latter being equal to 100 Gm. of eucaine hydrochloride.—Pharm. Ztg., *49*, No. 65 (Aug. 13, 1904), 684; from Therap. Monatsh., 1904, No. 8.

Hedralin—Characters and Tests.—On the basis of comprehensive investigations, Dr. Franz Zernik proposes the following characterization and tests for hedralin (resorcin-hexamethylenetetramine, $C_6H_6O_2.C_6H_{12}N_4$): Colorless crystalline needles, having a sweet taste and a creosote-like odor; soluble in about 14 p. of cold, and 4 p. of hot water; difficultly soluble in alcohol and chloroform, and very difficultly in ether. Basic lead acetate produces white precipitate in its aqueous solution (1+19). On careful heating of 0.1 Gm. hedralin with 3 Cc. of soda solution and 3 drops of chloroform, an intensely red liquid is formed. On boiling 2 Cc. of the aqueous solution (1+19) with 1 Cc. of diluted sulphuric acid, the odor of formaldehyde manifests itself; if then soda solution is added in excess and the heating continued, ammonia is liberated and the liquid acquires a red color. If a mixture of 0.5 Gm. hedralin, dissolved in 15 Cc. of water, and 5 Cc. of diluted sulphuric acid, be shaken out with 3 portions each of 10 Cc. of ether, the latter, on evaporation, should yield 0.22 Gm. of dry resorcin. Hedralin should be kept protected from light.—Apoth. Ztg., *19*, No. 87 (Oct. 29, 1904), 863.

Para-phenetidin—Ethylsulphone Derivatives.—W. Autenrieth and R. Bernheim have prepared several ethylsulphone derivatives of para-phenetidin and investigated their pharmacologic activity. The most important of these derivatives is apparently the *n*-ethylsulphone-*p*-phenetidin ($C_2H_5.O.C_6H_4.NH.SO_2.C_2H_5$), since it possesses besides antipyretic and antineuralgic activity, pronounced sedative and hypnotic action. It is obtained from *p*-phenetidin and ethylsulphochloride in handsome crystals, which are sparingly soluble in cold water, somewhat more soluble in hot water, but readily soluble in alcohol, ether, acetone and chloroform. Being a mono-substituted sulphamide, it has the properties of a monobasic acid, and is therefore readily soluble in alkalies, in ammonia, and in solutions

of the alkaline carbonates. A second derivative, *n*-ethylsulphone-phenacetin (*n*-ethylsulphone-*p*-acetphenetidid, $C_2H_5O.C_6H_4.N.CO.CH_3.SO_2.C_2H_5$) possesses no stronger pharmacologic activity than the non-substituted ethylsulphone-*p*-phenetidid; in fact it is apparently devoid of all hypnotic action. It was obtained in form of crystals, melting at 78° C., almost insoluble in cold water, but readily soluble in hot water, and in alcohol, ether, benzene and chloroform. Other derivatives obtained by the authors are: *n*-ethylsulphonbenzoil-*p*-phenetidid; *n*-ethylsulphonmethyl-*p*-phenetidid; *n*-ethylsulphonethyl-*p*-phenetidid; *n*-ethylsulphon-*p*-phenetidino carbonic acid ester; *p*-phenetidino carbonic acid ethyl ester; and *o*-nitro-*n*-ethylsulphone-*p*-phenetidid. The pharmacologic activity of these last mentioned derivatives was not investigated.—Arch. d. Pharm., *242*, No. 8 (Nov. 30, 1904), 579–589.

Paraphenylene-Diamine—Detection in Hair Dyes.—J. Thomann recommends the following method for the detection of paraphenylene-diamine in hair dyes, the presence of which, as has been frequently pointed out, is liable to produce troublesome eczema. After the addition of a little ammonium sulphydrate, to prevent oxidation, the hair dye is shaken out with ether, and from the etheral residue the paraphenyl diamine is readily sublimable in colorless crystals which melt a little above 143° C. It may be identified by the following reactions: The solution of the hydrochloride, heated with an excess of sodium hypochlorite, gives a white precipitate, which, when dissolved in dilute alcohol and crystallized, forms long needles, m. pt. 124° C. When heated with solution of hydrogen sulphide and ferric chloride a violet color is produced. A very dilute, faintly acid solution, treated with aniline and ferric chloride, gives a blue color.—Schweiz. Wchschr. f. Chem. u. Pharm., *42*, No. 46, (Nov. 12, 1904), 680-682.

Phenolphthalin—A Reagent for Hydrocyanic Acid.—F. Weehuizen finds that phenolpthalin—a compound obtained by boiling (reducing) phenolphthalein with zinc in alkaline solution—is a sensitive reagent for hydrocyanic acid. If a few crops of alkaline (NaOH) solution of phenolphthalin solution are added to the hydrocyanic acid solution, and a little later some solution of cupric sulphate (1 :2000), the phenolphthalin is oxidized to phenolphthalein, and a red coloration results. The reaction is distinct in solutions of HCy containing 1 :500,000. Heating of the liquids during the reaction must be avoided, because the alkaline phenolphthalin solution by itself acquires a red color when heated.—Pharm. Centralh., *46*, No. 13, (Mar. 30, 1905), 256.

Veronal—Chemical and Physiological Properties.—Under the name of veronal a condensation product of urea and diethylmalonic acid ester has in recent years attracted favorable attention on account of its pronounced value as a hypnotic and its comparative innocuousness in proper doses.

While much has been written concerning its physiological properties, very little has appeared concerning its chemical characters. Dr. B. Molle and Dr. H. Kleist now give some interesting information in both directions to serve as a guide for its possible introduction into the Pharm. Germ. After reviewing the chemistry of this product, Dr. Molle suggests the following characterization :—Veronal.

Diethylmalonylurea, $\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\!\!>\!C\!<\!\begin{matrix}CO{-}NH\\CO{-}NH\end{matrix}\!\!>\!CO$. White, faintly bitter, crystalline powder: Melting-point 191° C. Sublimable without residue, except possibly a faint trace of carbon. Soluble in about 145 parts of water at 20° C., in about 12 parts of boiling water, and readily soluble in ether, acetone, acetic ether, and warm alcohol; more difficultly soluble in chloroform, glacial acetic acid, benzin, and amyl alcohol. The saturated aqueous solution after acidulation with nitric acid yields on addition of Milllon's reagent a white, gelatinous precipitation. On adding 0.2 Gm. of veronal to melting caustic potassa, ammonia is developed; on acidulating the cooled melt with diluted sulphuric acid, carbon dioxide is eliminated and a fatty odor manifests itself.

Concerning the physiological effects of veronal Dr. Kleist concludes from experiments on frogs, dogs, rabbits, bacteria and blood, that it must be regarded as a prompt and relatively innocuous hypnotic when given in small doses, dangerous only when given in large doses, and that it possesses the advantage of ready solubility and resorption coupled with comparative freedom from taste. Its value as an antipyretic is not so pronounced, however, as has been claimed, the reduction in temperature in small doses safely given being insignificant.—Arch. d. Pharm., *242*, No. 6 (August 11, 1904), 401–406.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Filmaron—The Active Constituent of the Rhizome of Aspidium Filix Mas—Its Distinctive Characters, Composition and Constitution.—In a previous communication (see Proceedings, 1903, 719), Dr. E. Kraft had described in addition to the previously known constituents of the rhizome of *Aspidium Filix mas* filicic acid, flavaspidic acid, albaspidin, aspidinol —two new constituents, namely *flavaspidinin* and an amorphous acid, which he has named *filmaron*, and which he has proven to be the active constituent of the extract of male fern; while by the name of *filixnigrines* he designated certain amorphous decomposition products of these several bodies which partly pre-exist and are partly produced in the process of preparing the extract. Of these constituents filmaron alone is of importance, since it is both the active and most abundant constituent, and the sole carrier of the anthelmintic properties of the drug. Its presence has heretofore escaped notice because of the ease and rapidity with which its solutions in certain solvents are decomposed, although in its dry state it

has proven to be perfectly stable. This is particularly true of its solutions in the alcohols and in acetone, in which it undergoes spontaneous decomposition. Thus, in an acetone solution of filmaron, which previously had been perfectly free from filicic acid and filixnigrines, a precipitation of filicic acid occurs after standing a few days and continues up to a certain point, when it ceases; if then the solution is decanted, the precipitation of filicic acid begins again, but in each case slower, and if, finally, the acetone is distilled off in a vacuum, the residual filmaron, which originally was completely soluble in petroleum ether, contains considerable quantities of filixnigrines, which are insoluble in petroleum ether. Besides the characters of filmaron given by the author in the previous paper above referred to, stress is laid in the present paper on the following, which distinguish it from the other acid constituents of the extract: Filmaron must dissolve completely in petroleum ether; it must dissolve, even in the cold, in equal weights of carbon disulphide, of acetic ether, and of ethyl ether, and in these last named solutions, when kept in a cool place, no crystalline deposits must form even on prolonged standing. From the filixnigrines and from aspidinol it is distinguished by its perfect solution in petroleum ether; crystalline deposits from carbon disulphide indicate a content of flavaspidic acid, from acetic acid a content of filicic acid, and crystals from ethyl ether solution would point out the presence of aspidin. But notwithstanding that filmaron is an amorphous body, resisting all endeavors to produce it in crystalline form, the experimental part of the author's investigation proves it to be a true chemical compound, and not simply a mixture of different components of the drug. The experimental data show that filmaron is a complex compound of filicic acid and a second body, and that under the action of nascent hydrogen it is split into filicic acid and aspidinol, according to the following equation: Filmaron, $C_{47}H_{54}O_{16} + H_2 =$ aspidinol, $C_{12}H_{16}O_4 +$ filicic acid, $C_{35}H_{40}O_{12}$. This decomposition, moreover, is effected spontaneously in the alcoholic and acetone solutions, as previously described, the filixnigrin formed being identical with aspidinol. That this latter decomposition is not simply a separation of components in admixture, is moreover shown by the physiological action of the three substances concerned; filmaron acts as an anthelmintic, filixnigrin (or aspidinol) is inactive, while filicic acid, although toxic, is devoid of anthelmintic activity.—Arch. f. Pharm., *242*, No. 7 (Oct. 11, 1904), 489–500.

Filmaron—Taenifuge Value.—A. Jagnet confirms the taenifuge value of filmaron, contends that the taenicidal properties of the extract are shared by the other constituents of the filix rhizome. Nevertheless, it must be regarded as the most important constituent, both because of its superior quantity, and because of its freedom from unpleasant secondary effects. The author has obtained good results by administering 0.5 to 0.7 Gm. of filmaron, dissolved in 1 to 2 Gm. of chloroform and mixed with 20 to 30

Gm. of castor oil in beer-froth, in the morning before eating, following the dose one hour later with one or two tablespoonfuls of castor oil, also given in beer-froth.—Pharm. Ztg., *49*, No. 65 (Aug. 13, 1904), 684; from Therap. Monatsh., 1904, No. 8.

Glycyrrhizin—Percentages found in the Extract and some Commercial Products containing it.—Walter Reese and L. E. Sayre in a paper on "licorice" give the results of examination of commercial articles of licorice, such as the extract, small lozenges, troches, etc. and also plug tobacco, (Standard Navy) containing the extract. Pure extract of licorice was found to contain 16.5 per cent. of glycyrrhizin; licorice root of prime quality, 6.3 per cent.; troches contained only 5.4 per cent.; the tobacco contained 2.5 per cent. On the basis of the figures obtained, this tobacco would contain in 100 Gm. a quantity of glycyrrhizin corresponding to 40 Gm. of the root.—Proc. Kansas Pharm. Assoc., 1904, 70–71.

Linin.—Not the Active Principle of *Linum Catharticum*, which see under "Materia Medica."

Oxymethylanthraquinones—Percentages Present in Rhubarb, Rhamnus Barks and Senna.—In a previous paper, Prof. Tschirch had described a method for the determination of the oxymethylanthraquinones, free and combined, in certain purgative drugs, and had confirmed its reliability for the valuation of rhubarb (which see under "Materia Medica"). He has since applied the method to the valuation of different samples of rhubarb, of different kinds of rhamnus bark, and of senna leaves, with the results given below:

Percentages of Oxymethylanthraquinone, free and combined:

In Rhubarbs: Canton, flat, 4.0 per cent.; Shensi, flat, 3.3 per cent.; Shanghai, flat, 3.3 per cent.; Shensi, 2.8 per cent.; Canton, IIa., 2.8 per cent.; Gallicum, 2.8 per cent.; Canton, Ia., 2.5 per cent.; Anglicum, 2.5 per cent.; Anglicum, round, 1.8 per cent.; Austriacum, 1.6 per cent.; Rhaponticum, 1.2 per cent.

In Cortex Rhamni Frangulæ: Whole, I, 5 per cent.; II, 5 per cent.; III, 4.5 per cent.; in fine powder, 5 per cent. The alkaline solutions were pure cherry-red in color.

In Cortex Rhamni Purshianæ: Whole, I, 1.4 per cent.; II, 2.0 per cent.; III, 2.0 per cent.; in fine powder, 1.6 per cent. The alkaline solutions were reddish-yellow.

In Fructus Rhamni Cathartici, 0.76 per cent.

In Fol. Sennæ Alexandrinæ, 1.0 per cent.

In Fol. Sennæ Tinnevelly, 1.2 per cent.

In Folliculi Sennæ, 1.33 per cent. The alkaline solutions from the sennas were reddish with a greenish tinge, but became a handsome red when allowed to stand in contact with a small piece of KOH, or with ammonia during 12 hours.

In this connection the author has also determined the percentages of the free oxymethylanthraquinone.

Aloe-emodin, in different sorts of aloes; but, inasmuch as in these drugs only the presence of free oxymethylanthraquinone is concerned, the method of examination had to be modified—the more particularly, because even simpie warming of its solutions is sufficient to convert aloin into emodin. The method adopted was the following: 5 Gm. of the aloes are dissolved in 50 Cc. of cold 30 per cent. alcohol, and the solution shaken out with successive portions of benzene as long as a fresh portion acquired color. The united benzene solutions were then shaken out with ammonia as long as this acquired a red color and the united ammoniacal solutions were then diluted with water to a specified volume, and the intensity of color compared with that of a standard solution, as explained in the process above mentioned. The percentages thus obtained were the following:

In Aloe lucida, Cape, hard, 0.08 per cent.

In Aloe lucida, Cape, soft, 0.20 per cent.

In Uganda-aloes, (Cape aloes obtained by modern method) 0.5 per cent.

In Barbados aloes, 1.0 per cent.

In Barbados aloes, (obtained by modern method), 0.33 per cent.

In Curaçao aloes, 0.8 per cent.

To secure a pure red color in these cases it was here also necessary to expose the solutions to the action of ammonia for some time.—Schwz. Wschr. f. Chem. u. Pharm., *42*, No. 35 (Aug. 27, 1904), 456–457.

Oxymethylanthraquinones—Percentage, Free and Combined, in Purgative Drugs.—Christofoletti has determined the percentage of free and combined oxymethylanthraquinones in air-dried drugs by Tschirch's colorimetric method. He gives the following results:

Cort. rhamni frang.	4.5-5 per cent.
Cort. rhamni frang. (in fine powder,	5 per cent.
Cort. rhamni purshian.	1.4-2 per cent.
Cort. rhamni purshian. (in fine powder)	1.6 per cent.
Fruct. rhamni cathart	0.76 per cent.
Fol. sennæ alexand	1 per cent.
Fol. sennæ indicæ	1.2 per cent.
Folliculi sennæ	1.33 per cent.

In the examination of aloes a modified process was used in some cases so as to avoid the conversion of aloin into emodin. The different varieties gave yields as follows:

Aloë lucida cap., hard	0.08 per cent.
Aloë lucida cap., soft	0.2 per cent.
Uganda aloes (new method)	0.5 per cent.
Barbados aloes	1.0 per cent.
Barbados aloes (new method)	0.33 per cent.
Curaçoa aloes	0.8 per cent.

—Pharm. Centralh., *45*, No. 38 (Sept. 22, 1904), 725.

Populin—Simple Method of Preparation by Synthesis.—Benzoyl-salicin, or populin, which occurs naturally in the leaves and bark of various species of *Populus*, was prepared by Schiff, in 1870, by three different methods. Leonard Dobbin and Alex. D. White now describe how by one of these methods it can be conveniently made satisfactorily from salicin, by taking advantage of the Schotten-Bauermann reaction for introducing the benzoyl group. Twenty grams of salicin is dissolved in a liter of water, the solution cooled and made alkaline with potassium hydroxide. Benzoyl chloride is then added gradually, the solution being constantly shaken, so as to ensure that each portion of chloride is dissolved before another is added, the solution being kept alkaline with potash. Populin separates almost from the first, and when 10 grams of benzoyl chloride has been used, the precipitate is collected on a filter, washed and dried. It is then washed with ether (to remove tetra-benzoyl-salicin), and recrystallized from water and (finally) alcohol. The populin, so prepared, is identical with natural populin, and is odorless, which synthetic populin has not hitherto been.—Trans. Brit. Pharm. Conf. (Yearbook of Pharm.), 1904, 506–508.

Robinin—Characters and Products of Hydrolysis.—N. Waliaschko has studied the characters and products of the hydrolysis of robinin, which he prepared from the flowers of *Robinia pseudacacia* by a process described in detail. He obtained from 60 Kgm. of the fresh flower 87 Gm. (= 0.145 per cent.) of robinin, which possessed in nearly all respects the properties attributed to this glucoside by Zwenger and Dronke. It formed a pale-yellow crystalline powder, is odorless and tasteless, soluble in 50 p. of boiling water but requiring 3,000 parts at the ordinary temperature, and is sparingly soluble also in cold ethyl alcohol or hot methyl alcohol, though readily dissolved by hot ethyl alcohol. It begins to conglobate at 188° C. and melts completely at 195° C. In its elementary composition it corresponds to the formula $C_{33}H_{40}O_{19}$, which may, however, have to be doubled since it contains in an air-dry condition 7½ molecules of H_2O. On hydrolysis, either with acids or by the action of a ferment which appears to naturally exist in the flowers, robinin is split up, with the assimilation of 3 molecules of water, into a yellow coloring matter,

Robigenin ($C_{15}H_{10}O_6$), and into two sugars—rhamnose and galactose—according to the following equation : $C_{33}H_{40}O_{19} + 3H_2O = C_{15}H_{10}O_6 + 2C_6H_{12}O_5 + C_6H_{12}O_6$. Zwenger and Dronke had regarded this coloring matter to be quercetin ; but this is controverted by the author's results and will be the subject of a second paper. He anticipates this, however, by the statement that on the basis of its behavior to acids and alkalies as well as its elementary composition, robigenin belongs to the flavon-groups of coloring matters, the members of which have the composition $C_{15}H_{10}O_6$.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 383–395.

Santonin—Toxic Action.—The experiments of E. Wedekind show that

while santonin possesses little toxic activity on animals, with the exception of Ascarides, it is dangerous to man when given in doses exceeding 0.1 Gm. (1½ grains).—Ztschr. physiol. Chem., 1904, *43*, 240.

Saponin—Non-Toxicity.—W. Lohmann's investigations appear to prove that saponin is virtually non-toxic. Given to a rabbit in daily doses, beginning with 0.5 Gm., and increasing by that quantity up to 7 Gm. per diem, it had no effect except that of hardening the fæces. Post-mortem examination showed that the internal organs were not effected. The author then himself took quantities of saponin, starting with 0.1 Gm., and finishing on the tenth day with 1 Gm. No ill-effects were observed.—Pharm. Journ., Dec. 3, 1904, 813; from Ztschr. f. Oeffent. Chem., *9*, 320, through Analyst, 28, 361.

Quillaic Acid—Marked Toxicity.—P. Hoffmann finds that pure quillaic acid, isolated by fractional precipitation from commercial "quillaia-saponin" in alcoholic solution by means of ether, possesses marked toxicity (compare "Saponin", above). Administered by hypodermic injection, this is equivalent to 9 Mgm. to each Kilo. of body weight for cats and dogs. *In vitro*, red blood corpuscles are disintegrated in ten minutes by a 1 : 40,000 solution of quillaic acid. When hydrolized, it yields about 32 per cent. of sapogenin, 29.25 per cent. galactose, and a small quantity of sugar not fermentable by yeast.—Pharm. Journ., Dec. 10, 1904, 854; from Nouv. Remèdes, 1904, *20*, 458.

COLORING MATTERS.

Dyes—Behavior Towards Starch and Silicates.—W. Suida has studied the behavior of different dyes on such substances as starch, kaolin, kieselguhr, etc. Potato starch, free from albumin, was shaken in the cold with solutions of various dyes; after fifteen minutes the water was poured off, and the starch washed with distilled water until the water was not colored. It was found that basic dyes stain the starch strongly, but acid ones do not. Sulphonated dyes stain less strongly than the unsulphonated. Alcohol removes the color slowly, hydrochloric acid and acetone more quickly. By using sufficient starch, solutions of basic dyes can be completely decolorized. Kaolin, talc, pumice, and kieselguhr behave in a similar manner. After treatment with warm caustic soda and washing, kaolin will absorb acid dyes also.—Pharm. Journ., March 25, 1905, 441; from Monatsh. f. Chem., *25* (1904), 1,107.

Fast Colors—Method of Testing in Dyed Goods.—E. Davidis observes that the usual method of testing the fastness of a color to perspiration by means of acetic acid is quite unsuitable, as copious perspiration has an alkaline reaction. The following is a good test: Make a solution of 5 Gm. hard soap and 3 Cc. of ammonia in a liter of water, and soak the pattern to be tested with this for ten minutes, squeeze well, wrap tightly round a glass

rod with a piece of calico, and leave at about 50° C. until quite dry. The amount of "bleeding" is a good measure of fastness to perspiration.—Pharm. Journ., Mar. 25, 1905, 443; from Färber-Zeit., *15* (1904), 373.

Aniline Colors—Action of Low Temperatures.—J. Schmidlin finds that although no sensible diminution in color is evident when solid pigments or fabrics dyed with the same are exposed to extremely low temperatures, the same is not the case with certain colors in alcoholic solution. Some, such as methylene blue or malachite green, undergo no evident change under these conditions, but others are markedly modified. Thus, when an alcoholic solution of aniline hydrochloride is plunged into a vessel of liquid air a notable diminution of the red color occurs, and a fine greenish-yellow fluorescence appears, so that the solidified solution resembles that of eosine. Salts of hexamethylrosaniline show the same phenomena, the violet color becoming less intense, and a brown fluorescence appearing. In the case of eosine, although the intensity of the red color is lessened, no diminution occurs in the fluorescence. The results demonstrating the different effect of temperature on colors seen by transparence and fluorescence are in accord with Stokes' theory as to the different origin of these colors, and indicate the relationship which exists between ordinary color radiation and heat.—Pharm. Journ., March 18, 1905, 405; from Compt. rend., 1902, 931.

Rosanilines—Modification of the Old Nomenclature.—Jules Schmidlin criticises the nomenclature recently proposed by Baeyer as leading to very complicated terms for the rosanilines, for example, chloride of diaminomethylfuchsonimine for rosaniline chlorohydrate. He suggests instead a modification of the old nomenclature which retains many of the old terms and yet is quite exact. His system is shown in the following table:

Old Names.	Modifications.
Pararosaniline	Rosaniline.
Rosaniline	Rosamonotoluidine.
Fuchsine, C_{21}	Rosaditoluidine.
New fuchsine	Rosatritoluidine.
Aniline blue	Triphenylrosaniline.
Crystalline violet	Hexaphenylrosaniline.

The author applies this nomenclature in a new list of colorless rosaniline derivatives, the

Tetraoxycyclohexane Rosanilines, the formation of the tetrachlor and tetramine-oxycyclohexane rosanilines, both colorless addition products of rosaniline salts, having been described in a previous paper. He now finds that the salts of rosadi-and rosatritoluidine can take up four molecules of water when dissolved in concentrated HCl and allowed to stand. It is known that, in the case of salts forming addition products with an acid, a

base, or a neutral body, their state of non-saturation is due to the presence of a non-saturated carbon atom, which can take up monovalent groups. Hence there must be present four carbon atoms with double linkings in the molecule of rosaniline salts.—Chem. News, Oct. 21, 1904, 207; from Compt. rend., *139*, No. 12, Sept. 19, 1904.

Rosaniline—Formation of a Colorless Chlorhydrate.—Rudolf Lambrecht and Hugo Weil find that if ordinary crystalline rosaniline is dissolved in about two parts by volume of 30 per cent. hydrochloric acid, crystals separate out from the liquid, which on washing with hydrochloric acid and drying in the vacuum desiccator over lime, are quite colorless. Similar crystals again separate from the mother-liquor on standing. They dissolve in water, giving a faintly pink solution. On heating the intense red color the fuchsine salts appears. Rosaniline base separates out on addition of alkalis to these solutions. Analysis shows the formula to be approximately $C_{20}H_{21}N_3O.2HCl+4H_2O$. Thus colorless salts of rosaniline exist which have not three but only two molecules of HCl. Neufuchsine on similar treatment gives no crystals, even on standing for days.—Chem. News, Jan. 6, 1905, 10; from Berichte, *37*, (1904) No. 16.

Aniline Colors—Detection in Foods and Drink.—Charles H. LaWall recommends the following method for the detection of aniline colors in food and drink, which is dependent on its dyeing effect upon fat-free wool. The latter may be a good quality of nun's-veiling, freed from fat by boiling, first in a 5 per cent. solution of sodium hydroxide for a few minutes, and then repeatedly in pure water until the alkali has been entirely removed. This material is then cut into strips of a uniform size (about 1×2 in.), and preserved in a wide-mouthed, glass-stoppered bottle until needed. The material to be tested, if a liquid, is diluted with an equal volume of water; if solid or semi-solid, it is dissolved in about four times its weight of water, and strained to remove particles of pulp or cellular tissue. About 100 Cc. of the liquid is placed in a beaker, 4 Cc. of diluted hydrochloric acid (10 per cent.) is added, a single strip of the woolen goods is immersed in the liquid and the contents of the beaker are then boiled for five minutes. The cloth is then removed, washed in cold water, and then boiled for five minutes in water which has been very slightly acidulated with hydrochloric acid. If the coloring matter be of a fruit or vegetable origin, the cloth will either be uncolored or will be changed to a very faint pink or brown tint; but if coal-tar or aniline colors have been used, the cloth will be dyed a bright pink, red, yellow or brown, according to the color present. To confirm, remove the cloth from the acidulated water, wash it well with water, place it in a beaker with a little water, and add a few drops of stronger ammonia water. Vegetable or fruit colors will not dissolve, but will change to a green, purple or yellow color. Aniline or coal-tar colors will not be changed in color, but will be dis-

solved, especially when the solution is heated to boiling, after which, upon the removal of the cloth, acidifying as in the original dyeing test, immersing a fresh piece of cloth as before, the color will again be deposited. This second dyeing test is considered absolute proof of the presence of added coloring matter, as no fruit colors have yet been found which will be deposited upon the wool a second time, while aniline colors will always be so deposited. With *cochineal* the bright color obtained by the first test is changed to purple by ammonia; the second dyeing comes out colorless.—Proc. Penna. Pharm. Assoc., 1904, 92–94.

Poisonous Aniline Colors—Enumeration.—An extended examination of coal-tar colors, by C. W. Chlopin, has shown the following to be poisonous when taken internally:—

Aurantia, Mandarin Orange II, Metanil Orange (Methyl Orange), Butter Yellow, Auramine O, Brilliant Green, Sodium Auramine, Genuine Blue for Cotton, Ursol D, Thiocatechin, 1, 2, 3, and T, Autogenic Black, and Vidal's Black.

The following colors are classed as "doubtful"; having more less effect on the digestive or excreting organs:—

Metanil Yellow, Aniline Orange T, Pyrotin R R, Benzo-purpurin, Erica B, Lemon Yellow (?), Iodo Green, Acid Green, Bavarian Blue DBF, and DSF, Cerise DN, Iodesin, Rhodamine B and G, Chrysaniline, Benzoflavin II, Methylene Green, Primulin, and Quinoline Yellow.

The most toxic colors are found among the yellows, succeeded by the blues, the browns, and the blacks: very slight toxicity is found among the green or violet colors. Among the red colors, only one of "doubtful" toxicity was found, and not a single one that can be classed among the poisonous.—Pharm. Centralh., *45*, No. 48 (Dec. 1, 1904), 935.

Lichen Colors—Distinction from Coal-Tar Dyes.—L. M. Tolman says that archil, orseille or orchil, and cudbear coloring materials produced from lichens, are being used to a considerable extent for coloring medicines and foods where colors of coal-tar origin are prohibited. The methods of analysis now employed to detect coal-tar dyes, while sufficient for their distinction from the natural colors of the fruits and wine, are liable to lead to erroneous decision in the presence of these lichen colors. These methods depend on the dyeing of wool in an acid bath, then extracting the color with ammonia, acidifying this solution and dyeing a second piece of wool. While this eliminates the natural fruit colors, the lichen colors can not be thus eliminated since they are also extracted by ammonia, and dye with equal facility in an acid bath. It is however comparatively easy to distinguish the lichen colors from those of coal-tar origin. These colors can be extracted from ammoniacal solution by amyl alcohol, which separates them from the natural fruit colors. On evaporation of the amyl-alcohol, the purplish lichen coloring matter extracted can be tested. A watery solution of this color is readily reduced by Sn and HCl, and re-

oxidized $FeCl_3$, which at once eliminates all the azo dyes and magenta which are by far the most common dyes in use. If, therefore, we find by the wool dyeing tests that some added color is present and find that amyl-alcohol extracts a reddish-purple color from an ammoniacal solution, which is readily reduced by Sn and HCl, and reoxidized by $FeCl_3$, we can be certain that the added color is one of the lichen colors—archil, cudbear, or litmus—all of which act in a similar way.—Amer. Drugg., Dec. 19, 1904, 403.

Litmus—Reduction of the Blue Coloring Matter in absence of Air.—Kunz-Krause states that indigo is uniformly a constituent of litmus, and that it is gradually precipitated from alcoholic litmus solution. Furthermore, that just as indigo is decolorized in alkaline glucose when air is excluded and again becomes blue on admitting air, so litmus solution loses its color when air is excluded. To insure the solution of its deep blue color, a litmus solution must therefore be kept in open containers; although, if a little thymol is added to the solution, it may be kept for a long time in close containers.—Pharm. Ztg., *49*, No. 81 (Oct. 8, 1904), 865; from Proc. German Naturalists, Breslau, 1904.

Pure Litmus—Preparation.—Otto Foerster states that he purifies commercial litmus as follows: After extraction, in the cold, with ordinary spirits, and subsequent digestion with water, the solution is filtered and evaporated. The residue is dissolved in water, and again precipitated therefrom by means of absolute alcohol, to which a small amount of glacial acetic acid has been added. The precipitate is washed with alcohol, and, after a second solution, in water, submitted to the same treatment as before. The resultant precipitate is dried on the filter, and submitted to repeated washings with alcohol in order to get rid of the last traces of acid. It is then once more dissolved in distilled water, filtered, precipitated with weakly ammoniated alcohol, washed with pure alcohol, dried, and is then ready for use in the most delicate reactions.—Nat. Drugg., Nov., 1904, 460.

Quercitrin—Formula.—Dr. D. H. Brauns has experimented with the object of definitely settling the formula of quercitrin, a rhamnoside contained in the bark of *Quercus tinctoria*, Mich., which has long been known and has frequently been the subject of experiment. He finds that the air-dried substance loses 7.49 per cent. of water when dried at 130° C., and that on continuing this heat to 140° C. no further loss was occasioned. The air-dry substance, after several recrystallizations from diluted alcohol, has the composition $C_{21}H_{20}O_{11},2H_2O$.; after heating to constant weight at 130° C. it was anhydrous, having the composition $C_{21}H_{20}O_{11}$. The data obtained by the author's experiments indicate that the differences in the molecular composition found by Herzig and Wachs are due to the variations in temperature at which their respective products were dried.—Arch. d. Pharm., *242*, No. 8 (Nov. 30, 1904), 561–562.

Biliary Coloring Matters—Simple Method of Detection.—The well-known oxidation of bilirubin by nitrous acid into biliverdin is recommended by W. Presslich for a simple method of determining bile pigments in urine. A drop of fuming nitric acid is added to 15 Cc. of the suspected urine, when, in the presence of bile pigments, the lower half of the liquid at once assumes an emerald-green color, which even spreads throughout the entire liquid.—Pharm. Ztg., *50*, No. 18 (March 4, 1905), 189; from Münch. Med. Wschr., 1905, No. 5.

Albuminoids.

(including animal products.)

Plant Proteids—Classification.—D. Prianischnikow proposes the following classification of the proteids in plants and seeds, which are numerous, and differ in their behavior to solvents: 1. Proteids soluble in water, the plant albumins. 2. Proteids insoluble in water, but soluble in salt solutions, the plant globulins. 3. Proteids soluble in 70 to 80 per cent. alcohol and slightly precipitable by sodium chloride, *e. g.*, gliadin. 4. Proteids insoluble in the ordinary neutral solvents, but extracted by alkalies and precipitated by acids, and containing much phosphorus, the plant casein. —Pharm. Journ., Nov. 5, 1904, 662; from Landwirtsch. Vers. Stat., *60*, 15.

Protamines—Investigation.—Goto observes that the chemistry of proteids is not yet sufficiently advanced to give an intimate knowledge of their constitution. The substances classed under this name show certain physical similarities, and have certain color reactions in common which are used as a basis of classification, and it is difficult to determine when the products of alteration of proteids cease to be proteids. In tryptic digestion certain amido-acids are produced which are certainly not proteids, but the substances called by Kossel protamines. Mr. Goto has prepared a series of these protamines from the spermatozoa of various fishes. These were eventually obtained pure as double chloride with platinum, and appear much simpler in constitution than ordinary proteids, while showing reactions hitherto regarded as characteristic of the proteid group.—Pharm. Journ., Aug. 6, 1904, 178; from Zeit. Physiol. Chem. through Zeit. f. Untersuch. d. Nahr., *7*, 733.

Albumen—Direct Gravimetric Method of Estimation in Urine.—A. Belloeq recommends a new, direct gravimetric method for the determination of albumin in urine, as follows:—100 Cc. of the urine is decanted into a 300 Cc. flask and a large excess of calcium acetate dissolved therein. It is then rendered distinctly alkaline with ammonia and gently boiled, with constant agitation, until the froth formed by boiling is slight and clear, and rapidly subsides on removing from the source of heat. Only then will the albumin be thoroughly coagulated. The precipitate, con-

sisting of lime salts and albumin, is then collected by filtration, transferred while still moist to a test tube, and treated with 3 Cc. of nitric acid. The lime salts are slowly dissolved, with effervescence, and the albumin remains insoluble. After half an hour's contact with the acid, the tube is filled up with strong alcohol; on shaking, a more or less turbid liquid, according to the amount of albumin present, will be obtained. This turbidity quickly aggregates to a flocculent precipitate, which subsides; it is collected, washed with alcohol, drained, dried, and weighed.—Pharm. Journ., Dec. 10, 1904, 854; from Bull. de la Féd. des Pharm. du Sud-ouest et du Centre, 1904, *44*, 257.

Manganum Albuminatum—Preparation and Characters.—D. Vitali prepares an albuminate of manganese by carefully adding, with continuous stirring, 30 Cc. of a 5 per cent. solution of potassium permanganate to a solution of egg albumen obtained from three eggs by beating them with water, allowing to stand and straining through a cloth. The brown solution so obtained, on evaporating to dryness at 30° C., yields thin brown lamellae, which are almost tasteless, slowly soluble in cold water, more rapidly in warm water, and contain 3.3 per cent. of manganese, calculated as Mn_3O_4. Manganese albuminate is quite stable in solutions, is easily digested and assimilated, and therefore, therapeutically, particularly well adapted for the treatment of children's diseases in which it is indicated.—Pharm. Ztg., *49*, No. 40 (Nov. 9, 1904), 960; from Bull. Chim. Farm, *43*, No. 17.

Manganum Albuminatum, a specialty recommended for anaemic conditions, and originally believed by its exploiters to have a definite composition, has been re-examined by them and found to be a mixture consisting partly of pure and oxidized albumen with manganese and potassium.—Bull. Chim. Farm., 1905, No. 5.

Silver Albuminates—Review.—K. Alpers interestingly reviews the history, development and methods of production of the compounds of silver and albumin or albuminoids which have followed the original observation of O. Loew (1883), that silver nitrate is capable of forming certain characteristic compounds with albumin. These compounds have since then been introduced into medicine under various names, such as argonin, protargol, nargol, silver paranuclein, silver proteid, etc.—Pharm. Ztg., *49*, No. 86 (Oct. 26, 1904), 915.

Milk—A New Constituent.—In the course of manufacturing milk sugar, G. Biscaro and E. Belloni frequently observed the formation of small, flaky crystals upon the larger crystals of lactose. On examination, these proved to be composed essentially of the potassium salt of a new organic acid, which the authors have named

Orosic Acid.—The potassium salt is obtained pure, in the form of long, white crystals, by dissolving the small flaky crystals in warm water, filtering the solution through bone-black, cooling and crystallizing, washing the

crystals with luke-warm water until the washings no longer reduce Fehling's Solution. It is sparingly soluble in water (cold?), and gives white precipitates with basic lead acetate and with silver nitrate. The free acid, which may be obtained from the solution of the potassium salt by treatment with H_2SO_4, fuses at about 260° C., and has the composition $C_5H_6N_2O_4$.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 476; from Ztschr. f. angew. Chem., 1905, No. 19.

Milk—Rapid Method of Examination.—Bordas and Touplain recommend the following rapid method for milk examinations: 10 Cc. of the milk are added drop by drop to 65 per cent. alcohol, acidulated with acetic acid, in a centrifuging tube, allowed to subside a few moments, and are then centrifuged. The supernatant liquid is then decanted, the precipitate is suspended in 30 Cc. of 50 per cent. alcohol, and again centrifuged and the liquid decanted. The milk-sugar is then determined in the united decantates with Fehling's Solution. The fat is then determined in the precipitate by centrifuging it, first with 2 Cc. of 96 per cent. alcohol for a minute, and then with 30 Cc. of ether in the same way. The ether is evaporated and the residual fat weighed. The centrifuging tube now contains only the pure casein, which is readily dried, producing a white powder, and weighed. Finally an ash determination is made in 10 Cc. of the same milk.—Pharm. Ztg., *50*, No. 45 (June 7, 1905), 476; from L' Union Pharm., 1905, 208.

Milk—Precaution in Testing its Quality with Alcohol.—According to a sanitary regulation issued by the police department of Berlin, the older test of B. Martiny, which consists in boiling a portion of the milk to ascertain its freshness and non-coagulability by heat, is replaced by the more convenient one, of adding an equal volume of 70 per cent. alcohol, which on admixture with the milk should not produce a coagulum, but does produce such if the milk has begun to acidify and is, consequently, in an unsuited condition for food. Dr. F. Reiss observes, however, that in carrying out this test it is important that the alcohol be of assured neutrality, lest an injustice be done to the purveyor of milk that is of acceptable quality.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 819.

Milk—Fat Determination by Means of Acetone.—P. Soltsien recommends acetone for determining the fat in milk examination. The milk is shaken with twelve times its volume of acetone (b. p. 56°–58° C.), which retains the fat and water on subsidence. The non-fatty residue is washed with a little warm acetone, and the united acetone solutions are then evaporated, and the residual fat is weighed. The fat determination of cream is made similarly, but here it is recommended to use a mixture of 1 vol. of acetone and 1½ vol. of absolute ether. Butter may be examined in the same way as cream.—Pharm. Ztg., *50*, No. 38 (May 13, 1905), 398.

Milk—Methylene Blue to Distinguish the Cooked from the Raw.—

Schardinger employs the following reagent to distinguish raw from cooked milk. Five Cc. of alcoholic solution of methylene blue is mixed with 5 Cc. of formalin and 190 Cc. of water. Twenty Cc. of the milk is mixed with 1 Cc. of the reagent and heated for ten minutes over the water-bath to 40–45° C. Under these conditions raw milk completely decolorizes the reagent, but boiled milk is without action on it. Sour milk, whether raw or cooked, immediately discharges the color of methylene blue, so the test must be applied, in this case, to a neutral or alkaline solution.—Pharm. Journ., Dec. 3, 1904, 815 ; from Ztschr. f. Unters. Nahr. u. Genussm., through Nouv. Remédes, *19*, 229.

Milk—Estimation of Added Water by Determination of Freezing Point.—The observation of Winter that the determination of the freezing-point of milk gives a rapid and accurate method of estimating the amount of water added is confirmed by Basset. He finds that the freezing-point of milk from Bordeaux is found to be -0.585° C., as against -0.55° C., found by Winter, and hence it is concluded that this constant must be found for each district, and perhaps for each season of the year. If T be the freezing-point of pure milk, A the observed freezing-point, the percentage of added water $= 100 \frac{T-A}{T}$.—Pharm. Journ., April 15, 1905, 553; from Bull. Soc. Pharm. de Bordeaux, 1904, *44*, 325.

Milk—Sterilization by Means of Hydrogen Dioxide.—G. Budde observes that the bactericidal effect of hydrogen dioxide is materially augmented if the milk to be sterilized is heated to 40°–60° C.; for, although the enzymes present in the milk split off oxygen from the peroxide at the ordinary temperature, this is effected more rapidly at 50° to 55° C., and the consequent action upon the micro-organisms in the milk is far more energetic. The author therefore recommends that milk be sterilized with hydrogen dioxide, which has the further advantage that the preservative is completely decomposed and rendered innocuous during the process of heating. To the cold milk only 0.05 per cent. hydrogen dioxide is added, and it is then maintained at about 50° C. in a close vessel for 8–10 hours, during which the milk is not subject to any decomposition whatever. The H_2O_2 must, however, be free from acidity.—Pharm. Ztg., *49*, No. 89 (Nov. 5, 1904), 949; from L'Union Pharm., 1904, No. 9.

Condensed Milk—Determination of Cane Sugar.—F. Watts and H. A. Tempany find that the method of Stokes and Bodmer for the determination of cane sugar in condensed milk gives results that are too low, owing to the retarding influence of some constituent of the milk on the inversion of the sugar. If, however, the milk, diluted till the liquid contains between 5 and 10 per cent. of cane sugar, be boiled for forty minutes instead of ten minutes with citric acid, correct results are obtained.—Pharm. Journ., June 3, 1905, 821 ; from Analyst, *30* (1905), 119.

Koumyss—Practical Observations.—E. F. White makes among others the following practical observation concerning Koumyss and its manufacture :—Koumyss may be divided into three classes—"new", "medium", and "old". Fermentation once commenced in its preparation never stops until the koumyss spoils. For about four days we can call it "new," in which state it contains comparatively little acid. For the next week it is "medium" and moderately acid. After that it is "old" and quite acid, and soon, depending upon the product and conditions, unfit for use. Koumyss may be prepared so that its fermentation is not so great, and then may be dispensed the same as any other fermented drink, as root or spruce beers.

KOUMYSS NO. 1.

Fresh, unskimmed milk	Cong. iijss.
Skimmed milk	Cong. vij.
Water	Cong. jss.
Granulated cane sugar	av. lb. ijss.
Sugar of Milk	av. ozs. viij.
Compressed yeast	ʒ j.

Place the skimmed milk in a double boiler, or steam-jacket kettle, to prevent scorching, and heat to 100° F. Incorporate one-third of the yeast thoroughly with a small amount of milk and add to the hot milk, keeping it at 100° F. until the casein separates into a thick mass, then pour off the whey, and strain the residual casein, so as to obtain all of the whey, and mix it into the unskimmed milk. Now mix the balance of the yeast as described, and add to the milk, then dissolve the sugar in the water and add that. The container should be of wood, in which it is stirred every five minutes to keep the casein suspended during the time required for bottling, the koumyss being drawn off through a faucet into very strong bottles, preferably champagne quarts and pints—these being filled to within three inches of the top, securely corked, and the corks, protruding not more than a quarter of an inch above the top, are then wired or tied down with strong twine. Then place the bottles in a room where the temperature is about 75° F. for eighteen hours, shaking every six hours, then place in an ice-chest as directed, where the temperature is below 55° F.

KOUMYSS NO. 2.

Skimmed milk	Cong. j.
Distilled water	O ij.
Bicarbonate sodium	grs. 100.
Honey or sugar	av. ozs. viij.

Heat the milk as in No. 1, until a fairly tough pellicle forms upon its surface. Set aside for twelve hours, then remove the pellicle and any other solid particles found on the surface of the milk. Add the other ingredients in the order they are given. Now start the fermentation by

adding to each gallon of mixture a pint of fairly new koumyss. Bottle at once, keep at a uniform temperature of about 80° F. for eighteen to twenty-four hours, then place in an ice-chest as in No. 1.—Midland Druggist, Febr., 1905, 537; from "Spatula."

Nutrient Kefir—Preparation.—In a treatise on "nutrient kefir," in which the history of kefir preparation, the nature and function of the kefir fungus, and the composition of the finished beverage are comprehensively considered, R. Kobert recommends the following approved process for preparing the

Kefir-Ferment: 50 Gm. of the dry kefir grains of commerce are covered with 1 liter of water at 30°–35° C.; the water is poured off after 30 minutes and replaced by the same quantity of fresh water heated to 20° C., in which it is allowed to remain at room temperature 24 hours. The grains are then removed from the water, drained on a cloth or fine sieve, and transferred into ½ liter of clean fresh milk, just milked and at the udder-temperature, or reheated to that temperature and allowed to stand with frequent shaking 24 hours at the room temperature. The milk is then poured off, the grains are washed with cold water to remove adhering milk coagulum, and ½ liter of milk of the same quality and condition as before is again poured on and the treatment continued as before for 24 hours. This treatment is repeated for 3–4–7 days—the right period being indicated when the fungi, which up to this stage have remained on the bottom, rise to the surface, forming "top-ferment." At the same time, they will be found to have lost an unpleasant cheesy odor, and their color is again restored to yellowish. But even when this stage of their development is reached, the fungi are not yet sufficiently strong, and the treatment with milk must be continued five days longer. The fungi so obtained are then reduced to he condition of a magma, in which condition the ferment is used to prepare

Kefir.—For this purpose about 250 Cc. of the magma are mixed with 2 or 3 liters of fresh milk, and the mixture is set aside, with occasional shaking, for 12 to 24 hours at the room temperature. During this time it acquires the appearance and consistence of cream and an agreeable acidulous odor. It is strained through a cloth, and filled into bottles provided with patent stoppers. The residue on the cloth, which has become quite voluminous, is used at once with fresh portions of milk to make a new lot of kefir. The freshly bottled kefir, which retains some of the kefir microbes, is allowed to stand in a warm room and occasionally shaken until its finely flocculent appearance indicates that it is finished. This should be within 24 hours. If preferred, the bottles may be only half-filled with kefired milk and the filling completed with fresh milk, but the period of ripening is then somewhat prolonged. The kefir should be well cooled and vigorously shaken before use.

Nutrient Kefir is obtained by adding to the kefir immediately after straining and before bottling some meat somatose, in proportion of 10 to 20 Gm. per liter. It may also be mixed with other desirable nutrients or medicaments.—Pharm. Ztg., *59*, No. 77 (Sept. 24, 1904), 819.

Matzoon—A Fermented Milk Preparation.—W. A. Puckner, among other milk preparations, such as buttermilk, koumyss, kephir, peptonized and malted milk, describes a preparation of milk sold as "Matzoon." This is prepared by adding yeast to rich milk that has been warmed. The mixture is set aside in a warm place for 6 to 12 hours and when curdled is well stirred. A portion of this is then used to curdle another portion of milk, from which again a portion is used to curdle new milk, and so forth. The portions first obtained are rejected because they taste of yeast. It has a rich, slightly acid taste and ordinarily is of the consistence of bonny-clabber, and is therefore eaten with a spoon, often sweetened with sugar. The composition of "Matzoon" is similar to that of koumyss, but since the fermentation is allowed to continue but for a short time the amount of acids, etc., produced by the fermentation is very small. Usually the fermentation is regulated so that just sufficient lactic acid is formed by the action of the lactic ferment on the milk sugar to precipitate the casein in a finely divided state and to give the milk a faintly sour taste, while at the same time but slight traces of alcohol and carbon dioxide are produced.—Amer. Drugg., Feb. 13, 1905, 67–69.

Casein—Medicinal and Industrial Uses.—Cornelius Zeisler calls attention to the extensive uses to which casein is modernly applied in chemistry and pharmacy, as well as industrially in the arts. Its uses in these various directions are becoming more and more numerous, but particularly so in the manufacture of remedial agents which the pharmacist is expected to supply. After a description of the method of preparing casein, its physical and chemical character, the author enumerates and describes a large number of casein compounds, which can only be referred to here by title, as follows: aluminum caseinate, argonin, arsenic caseinates, casanthrol, casein glycerophosphate, casein phosphate, casein ointment, casein ammonia liniment, casein varnish, iodcasein and compounds, casein creams, saccharated casein, etc. The last named is particularly serviceable as an emulsifying agent. Industrially it is used for preparing cements and paints, as a substitute for albumen in dyeing and calico printing, as a filler and mordant in the manufacture of paper, playing cards, etc., for the production of artificial horn, ivory and amber for knife handles, pipe stems, etc.—Amer. Drugg., Jan. 23, 1905, 35–36.

Casein Phosphate—Industrial Production.—The following method of producing casein phosphate, which is designed to be a strongly acid compound suitable as an acid ingredient in baker's yeast, is given in "La Revue des Produits Chimiques:" A sufficient quantity of phosphoric acid is incorporated with the casein or a caseinate in such a way as to insure

sufficient acidity in the resulting compound. The employment of 23 to 25 parts by weight of phosphoric acid with 75 to 77 parts of casein constitutes a good proportion. An aqueous solution of phosphoric acid is made, and the casein introduced in the proportion of 25 to 50 per cent. of the weight of the phosphoric acid present. The mixture is then heated till the curdled form of the casein disappears, and it assumes a uniform fluid form. Then the mixture is concentrated to a syrupy consistency. The remainder of the casein or of the caseinate is added and mixed with the solution until it is intimately incorporated and the mass becomes uniform. The compound is dried in a current of hot air, or in any other way that will not discolor it, and it is ground to a fine powder. The intimate union of the phosphoric acid and casein during the gradual concentration of the mixture and during the grinding and drying, removes the hydroscopic property of the phosphoric acid, and produces a dry and stable product, which may be regarded as a hyper-phosphate of casein. When it is mixed with water, it swells and dissolves slowly. With an equivalent of sodium bicarbonate this casein hyper-phosphate liberates about 17 per cent. of carbon dioxide. The casein for its preparation may be precipitated from skimmed milk by means of a suitable acid, and should be washed with cold water to remove impurities. A caseinate may also be employed, such as a compound of casein and an alkali or an alkaline earth.—Nat. Drugg., Sept., 1904, 274.

Glutin—A Useful Casein Preparation.—According to "Farben Zeitung," glutin is a casein preparation used in paper hanging, as a thickener in color works, in printing and other occupations where a paste of great adhesive properties is requisite. It pastes paper, cloth, etc., on metals, glass, wood, in short, on any solid surface. When it once dries it resists water quite well, and gives surfaces to which it is employed (as, for instance, in printing wall paper in colors, etc.) a handsome polish. The addition of a little glycerin to glutin gives elasticity and flexibility to any application of it (after drying). Glutin dissolves completely in glycerin, yielding a fine tenacious mass, which, laid on paper in certain determined proportions, and, after drying, drawn through as solution of alum, is converted into a substance having all the qualities of leather. By means of its content in wolframic acid, glutin imparts to decoctions of the dyewoods the greatest imaginable variety of colors. For instance, when cotton or linen stuff is saturated with glutin and treated with a decoction of brazilwood, the stuff takes a violet color. If this, after drying, be treated with acids, or solutions of mineral salts, it takes wash-proof colors of the greatest variety of shades.

Glutin is prepared in the following manner: Skim milk is curdled and the curd is freed of the whey, as far as possible, by pressure, dried and then reduced to a uniform, somewhat coarse, powder. This is achieved, in factories, by passing it between rollers having a reciprocating motion.

The dry powder is now treated with a solution of sodium wolframate, and again passed through the rollers, whereby the material is reduced to the finest possible powder. If the casein to be operated on still contains much buttermilk, it is first stirred with very dilute hydrochloric acid and washed with water until absolutely neutral, then treated with the sodium wolframate solution. The mass of mingled casein and wolframate passes now to a jacketed kettle, the jacket being filled with water, which is brought to a boil. When the mixture begins to dry, a very small amount of water is added, the stirrer is put in motion, and the agitation is kept up, under a brisk fire, until the mass fuses and unites completely. A sample is removed from time to time to discover when this occurs. The fire is then drawn and the material poured out, on slabs, to cool. When cold, it forms a mass more or less rigid, according to the amount of water added at the finale.—Nat. Drugg., July, 1904, 193.

Galalith—A new Substitute for Horn, Ivory, &c., from Casein.—A new substance, intended to replace horn, ivory, tortoise shell, &c., is now being made from casein by subjecting it to strong pressure under treatment with formaldehyde. The casein is precipitated by acids or by the salts of heavy metals, and the precipitate expressed with force whilst warmed until it becomes transparent, and the mass is then hardened by formaldehyde. It can be colored by aniline dyes or by copper, nickel, or other colored metallic salts. It has a sp. gr.of 1.30, contains 11.36 of nitrogen (72.66 p. c. of casein), and 6.69 per cent. of ash. It is scarcely affected by neutral liquids, but it is attacked slightly by acids, and more so by alkalies. Immersed in water for three days it becomes soft, brittle, and opaque, but recovers its hardness, elasticity, and brightness on drying.—Schweitz. Wschr. f. Chem. u. Pharm., *43*, No. 8 (Febr. 25, 1905), 103.

Gelatin—Solubility in Alcohol.—According to recent experiments by G. Heinzelmann the generally accepted statements that gelatin is insoluble in alcohol (and in ether) is not correct in so far as it applies to alcohol of 90 per cent. and under. He finds that alcohol of 86–90 per cent. dissolves small quantities of gelatin, amounting to 0.1–0.25 Gm. per liter, but that in stronger alcohols it is as claimed, insoluble. The observation is important in connection with the gelatinization of barrels used for storing alcohol, such being unsuitable for spirits containing less than 90 per cent. of absolute alcohol.—Schweiz. Wchschr. f. Pharm., *42* (1904), No. 26, 347; from Südd. Apoth. Ztg., 1904, 386.

Lecithin—Valuation of Commercial Samples.—Fendler proposes the following method for determining the amount of pure lecithin in the commercial product supplied under that name: A weighed portion of the sample is boiled for one hour with absolute alcohol in a flask connected with a reflux condenser, the solution filtered, the residue washed with alcohol, and then treated with ether in the same way. The united alcoholic and ethereal

solutions and washings are then evaporated, dried *in vacuo* over sulphuric acid and weighed. In the extract so obtained the nitrogen and phosphorus may then be determined in the usual manner. The author considers it important that the absolute lecithin content should be declared on each package, so that uniformity in dosage may be secured.—Apoth. Ztg., *20*, No. 3 (Jan. 11, 1905), 22.

Ferments—A New Reaction.—In the course of his researches concerning the occurrence of *phloroglucin* in plants (which see), Dr. Max Winckel has shown that the red color produced by vanillin and hydrochloric acid, which had been regarded as characteristic for the presence of phloroglucin, is given with equal facility by other phenols, and particulary by the tannins present. He has now made the observation that vanillin-hydrochloric acid produces a characteristic violet color with the ferments contained in certain oily seeds, such as almonds, mustard, linum, cacao, cotton, which is evidenced when a section of the seeds in question is touched with the reagent. The reaction was obtained with the following isolated ferments: Myrosin (emulsin or synaptase—Rep.), diastase, rennin, trypsin, invertin and ptyalin. It is uncertain whether in albumin giving the reaction, this is due to enclosed ferment, as is the case with reaction produced with casein.—Pharm. Ztg., *49*, No. 77 (Sept. 24, 1904), 815.

Pepsin—Improvement of the B. P. Process of Testing.—E. W. Lucas calls attention to the variable results liable to be obtained when the official (B. P.) method of testing pepsin is carried out. The sources of error in applying this test are two. In the first place, coagulated white of egg rubbed through a twelve-hole sieve does not appear in the fine shreds assumed, but in more or less compacted masses. These masses offer but little surface to the pepsin, and cannot be separated even by the most vigorous shaking. In the second, it is not practicable to weigh so small a quantity as 0.005 Gm. of a hygroscopic substance like pepsin. It is therefore suggested to modify the official monograph somewhat as follows: Tested in the manner described one part should dissolve 2,500 times its weight of freshly coagulated white of egg in six hours, the resulting solution being only faintly opalescent.

Into a stoppered bottle or flask of about 250 Cc. capacity, introduce 20 Cc. of the pepsin solution (containing 0.005 Gm. pepsin). Place 12.5 Gm. of the freshly coagulated white of egg in a small mortar with 50 Cc. of acidulated water and triturate until reduced to uniform granules. Transfer to the flask, washing out the last traces of solid matter with another 50 Cc. of the acidulated water. Place the flask in a water-bath, so that the water is higher up the flask outside than the mixture inside, and digest at a temperature of 105° F. (40.5° C.) for six hours, shaking vigorously at intervals of fifteen minutes. To make the pepsin solution, rub 0.25 Gm. of pepsin and 1 Gm. of sodium chloride in a small mortar until evenly mixed; add acidulated water very carefully at first, mix well, and

transfer to 1,000 Cc. flask; wash the mortar well with more of the acidulated water to make the solution up to 1,000 Cc. Preserve for twenty-four hours, shaking at intervals and immediately before use. Every 20 Cc. of this solution will contain 0.005 Gm. pepsin.—Pharm. Jour., Sept. 3, 1904, 376.

Peptic Protease—Investigation of its Character in Plants.—Vernon has discovered that an erepsin can be readily extracted from the various tissues of both vertebrate and invertebrate animals, and the results of his investigations as to the distribution and properties of this "tissue erepsin" demonstrated not only the fact of the essential similarity of distribution of erepsin in the tissues of animals and plants, but also indicate a gradual convergence in the properties of the erepsins. Vines has since ascertained that in certain cases (yeast, mushroom) the tissues contain a mixture of erepsin with a fibrin digesting enzyme, a result which finds its analogue in Vernon's researches on pancreatic trypsin. But he has not succeeded in determining the nature of this fibrin-digesting enzyme, in deciding whether it is a pepsin or a trypsin, because there is no method by which all the erepsin can be certainly removed from the mixture so as to leave the other enzyme isolated. Vines, however, has recently made some observations in another direction which, though not yet conclusive, at any rate indicate a method by which a physiological analysis of a suspected mixture of proteases may be attempted. In investigating the somewhat debated digestive properties of papain it was necessary, as in all experiments of this kind, to use an antiseptic. He tried various antiseptics, such as toluol, prussic acid and sodium fluoride, with the result that whilst in certain experiments both fibrin-digestion and peptolysis (of Wittepeptone) took place, in others peptolysis was effected without fibrin-digestion or *vice versa*. The latter result is susceptible of two explanations: it may indicate the presence of a single protease of the nature of trypsin, of which either the peptonizing or the peptolytic activity was paralyzed by the antiseptic, or it may indicate the presence of two proteases—the one peptonizing and of the nature of pepsin, the other peptolytic, an erepsin—the one having been paralyzed by the antiseptic but not the other. Of these two alternatives the first would seem to be the less probable, for it is natural to suppose that if a single protease were prejudicially affected, all the forms of its activity would suffer equally. If the second alternative prove to be well founded it will be of exceptional interest, for in that case these observations will have demonstrated for the first time the presence of a peptic protease in plants. Not only so, but it will also point the way to the solution of the problem as to the nature of the trypsin of animals, which may be thus shown to consist, as has already been suggested, of a mixture of pepsin with erepsin.—Pharm. Journ., Dec. 17, 1904, 900; from Proc. Linn. Soc., Dec. 1, 1904.

Lactase—Prevalence in Plants.—A. Brachin finds that lactase is widely

distributed in plants. Its presence has been demonstrated in the seeds of many plants of the rosaceæ—both in the pomaceæ and prunaceæ, except in the case of *Cotoneaster vulgaris*, which does not appear to contain this ferment. It is found in the cruciferæ, also in certain members of the cornaceæ and rutaceæ. It was not found in *Euonymus europeus*, *Capparis spinosa*, nor in *Berberis vulgaris*, nor was it detected in the lower organisms, *Aspergillus niger* or *Bacillus coli communis*. The experiments confirm the fact that lactase is a distinct ferment. It is destroyed at a temperature between 75°–80° C., or 10° lower than emulsin. Its fermentative action is arrested by the presence of 0.09 Gm. to 0.10 Gm. of sulphuric acid per liter. Oxalic acid is almost as fatal to the enzyme. Acetic acid in the proportion of 0.24 per cent. kills it, while emulsin is only destroyed by five times as much (1.2 per cent.). Tartaric acid has relatively but weak action on lactase fermentation, 7.5 Gm. per liter being required to destroy it.—Pharm. Journ., Oct. 29, 1904, 610; from Journ. Pharm. Chim. [6], *20*, 300.

Blood Ferments—Pathological Significance and Method of Estimation.—Ad. Jolles observes that if the assumption is correct that the ferment of blood,

Catalase, which has the property of splitting off oxygen from hydrogen dioxide, has the effect of splitting off oxygen from the oxyhæmaglobin in the organism, it is quite possible to utilize this property in pathological cases by estimating the amount of catalase by means of hydrogen dioxide under certain specified conditions. Applying this idea, the author, in conjunction with Oppenheim, has determined that the quantity of catalase is fairly constant in healthy subjects, but in certain pathological cases, for instance, tuberculosis, nephritis and cancer, this ferment is sometimes abnormally reduced in quantity. The authors, therefore, propose a "catalase-number," obtained by determining the amount of hydrogen dioxide decomposed by 1 Cc. of normal blood. The number fluctuates between 18 and 30; usually, however, between 20 and 26, whereas in the pathological cases mentioned the abnormal values of 1 to 10 have been observed. —Pharm. Ztg., *49*, No. 82 (Oct. 12, 1904), 874.

Catalase—Preparation from the Liver.—Batelli and Stern observe that catalase—the ferment which has the power of decomposing hydrogen dioxide—is found both in the animal and vegetable organism. In animals it is found in the greatest quantity in those organs in which chemical reactions are known to take place, and especially the liver. The tissues of cold-blooded animals contain less catalase than of animals with warm blood; but since the precise nature of similar ferments derived from other organs than the liver is not yet determined, the authors propose to designate the latter as

Hepato Catalase.—To prepare it, they macerate minced liver with water

at a low temperature in two successive portions; first for a few minutes, straining and pressing through a cloth, then repeating the maceration, with agitation, for an hour. The bulked liquids are then precipitated with twice their volume of alcohol. The precipitate is collected on paper and dried to drive off the alcohol; it is then suspended in three volumes of water and energetically agitated for several hours, filtered, and filtrate again precipitated with alcohol, pressed, and finally dried *in vacuo* over sulphuric acid. The brownish, amorphous powder thus obtained acts energetically on hydrogen peroxide, one part decomposing 3,000 to 4,000 parts.—Pharm. Journ., May 13, 1905, 693; from L'Union Pharm., *45*, (1904) 529.

Isocreatinine—Identity with Creatinine.—Dr. G. Korndörfer confirms the results of the inquiry of Prof. E. Poulsson into the nature and characters of the yellow-colored base isolated from the flesh of fish by Thesen and named by the latter isocreatinine, in distinction from the colorless base, creatinine, occurring in the flesh, muscular tissues, urine, etc., of mammals. As pointed out by Poulsson, the yellow color which is retained so tenaciously by isocreatinine is due to impurity, which is also responsible for the differences in solubility observed in the two bases and their respective compounds, and particularly in the picrate and certain compounds with salts of the heavy metals. When freed from the yellow coloring substance, which becomes possible by treatment with animal charcoal and conversion of the base into sulphate, the isocreatinine from fishes becomes perfectly colorless, and exhibits in every respect identical characters, physically and chemically, with the creatinine from mammals.—Arch. d. Pharm., *242*, No. 5 (July 4, 1904), 373–379.

Adrenalin—Preparation and Formula.—G. Bertrand obtains adrenalin of constant composition as follows: The fresh suprarenal gland of the horse, deprived of adhering fat, is rapidly comminuted, 600 Gm. of the mass placed into a two-liter flask, mixed by shaking with 5 Gm. finely powdered oxalic acid, and the flask filled with 95 per cent. alcohol. After macerating two days, the mixture is expressed, the press-liquid filtered, and the alcohol evaporated from the filtrate in a vacuum, which results in a deposition of lecithin. The residue is then shaken with petroleum ether, set aside to settle, the inferior aqueous layer is separated, carefully precipitated with lead acetate, and centrifuged. In this way a clear, yellowish fluid is obtained, which is evaporated in a vacuum and treated with ammonia in slight excess. The adrenalin is then precipitated in a crystalline condition. It is washed with water, dissolved in 10 per cent. sulphuric acid, mixed with an equal volume of alcohol, allowed to stand a short time, filtered, and again precipitated with ammonia. The adrenalin so obtained is washed with water and alcohol, and dried in a vacuum. From 118 Kgm. of the fresh organ 125 Gm. of adrenalin were thus obtained. This was subjected to fractional precipitation, and numerous

fractions obtained, all of which, without exception, had the composition corresponding to Aldrich's formula, $C_9H_{13}O_3N$.—Pharm. Ztg., *49*, 88 (Nov. 2, 1904), 939; from Rép. de Pharm., 1904, No. 10.

Adrenalin—Formula.—Prof. H. Pauly takes emphatic exception to the empyrical formula, $C_{10}H_{13}NO_3{}^1/_2H_2O$, proposed by Prof. Abel for adrenalin (Epinephrin Hydrate—Abel—see Proceedings, 1904, 971), supporting rather the formula, $C_9H_{13}NO_3$, first proposed by Aldrich. In order to overcome the objections of Abel to the analytical results previously obtained by the author, he has prepared an adrenalin entirely free from organic as well as inorganic phosphorus, and found that the nitrogen-content remained the same as in his four or five previous analyses. Experiments were also carried out which showed that the adrenalin employed for the analyses were entirely free from adherent ammonia, while the contention of Abel that adrenalin obtained by precipitation with dilute ammonia contains adherent ammonia that is difficult to wash out is also shown to be erroneous. It is also shown conclusively by drying adrenalin at different temperatures that it contains no water of crystallization according to the formula $C_{10}H_{13}NO_3{}^1/_2H_2O$ (Abel). That adrenalin contains no water of crystallization was shown also by Abel's own experimental work when he heated the substance to 145°–160° C. *in vacuo* without appreciable loss; but, nevertheless, this observation, evident as it is, did not suggest to him the only possible conclusion that adrenalin contains no water of crystallization. Professor Pauly's results lead him to the conclusion that the formula $C_{10}H_{13}NO_3{}^1/_2H_2O$ proposed by Abel is incorrect. This formula, together with the name "epinephrin hydrate," which designates the same, should be blotted out of the literature. The name "epinephrin," however, should remain now as before for the basic substance obtained by treating adrenalin with concentrated H_2SO_4, or with dilute acids under pressure, and to this the formula $C_{10}H_{13}NO_3$ should be given. This body, whose chemical composition is different from that of adrenalin, and whose physical, chemical, and pharmacological properties are different from the real blood-pressure-raising substance, should be considered a transformation product of the active principle.—Merck's Rep., Dec., 1904, 361; from Berichte, *37* (1904), 1388.

Suprarenin (Adrenalin)—Preparation.—In continuation of his previous work, Fuerth describes the following process for preparing the pure basic constituent of the suprarenal capsule, to which he gave the name suprarenin, but which is identical in chemical and general characters with the adrenalin of other investigators: Fresh suprarenal capsules are extracted with slightly acid water in the presence of a little zinc dust. The aqueous extract is concentrated at 50° C. *in vacuo* in a current of CO_2, the residue being first precipitated with methyl alcohol, then by lead acetate. The filtrate, freed from excess of lead by means of sulphuric acid, is again

evaporated *in vacuo* in an atmosphere of CO_2; the adrenalin is finally liberated by ammonia, washed first with water, then with alcohol, and finally with ether, and dried over H_2SO_4 *in vacuo*. It is thus obtained in perfectly white crystals. The yield is approximately 0.2 per cent. Fuerth confirms the formula attributed by Aldrich to adrenaline, $C_9H_{13}NO_3$, and confirms Abel's statement, that however carefully preserved, the base, on keeping, undergoes decomposition, giving off a basic body. Fuerth finds that the loss of nitrogen with adrenalin kept *in vacuo* may amount to 2 or 3 per cent., but it depends greatly on the purity of base. The provisional formula, $[CH_3.NC_2H.OH]C_6H_6.OH.OH$, is suggested for suprarenin.—Pharm. Journ., Jan. 7, 1905, 14; from Monats. f. Chem., through Journ. de Pharm. et Chim. (*6*), *18*, 362.

Adrenalin Substitute—A New Synthetic.—Roser has succeeded in developing a series of homologous synthetics (aminoketones, æthylaminoketons, etc.), having pharmacologic properties similar to adrenalin or suprarenin. Among these the substance described as

Methylamino-ortho-dioxyacetophenon is claimed to possess absolutely the same pharmacologic action as adrenalin when administered intravenously. —Pharm. Ztg., *49*, No. 82 (Oct. 12, 1904), 876.

Diphtheria Antitoxin—Concise Description.—Dr. R. Tanner Hewlett gives the following concise description of diphtheria antitoxin:—Diphtheria antitoxin may be fluid or dry. The fluid antitoxin is an amber-colored liquid, giving the proteid reactions, and is precipitated on heating and by alcohol. It should be bright and clear, with little sediment. Cloudiness or turbidity may indicate either the development of micro-organisms or a product some months old: in the latter case standing the bottle in warm water (40° C.) will often much lessen the turbidity. Microscopical examination should not show the presence of any micro-organisms, and there should be an absence of any odor. The solid antitoxin occures as amber-colored scales, or granules (not unlike coarse Demerara sugar), or as a yellowish powder, and is slowly soluble in cold, but not in hot, water (above about 50° C.), nor in alcohol. Dose—2,000 to 20,000 units. Prophylactic dose—500 units.

The antitoxin is the serum of a horse that has been repeatedly injected with increasing doses of diphtheria toxin, the filtrate of a broth culture of a virulent diphtheria bacillus. This serum may be regarded as a solution of the antitoxic constituent, the amount of which varies, and the therapeutic dose is therefore always reckoned in units, and is independent of the volume of the serum. In order to ascertain the potency of the antitoxin its strength in units has to be ascertained by careful testing. This is carried out by innoculating a series of guinea-pigs with varying amounts of the antitoxin, together with a test dose of the toxin, and so ascertaining the smallest amount of the serum which will completely neutralize the toxin. The unit of antitoxin corresponds to 105 to 115 minimal lethal

doses of a toxin for the guinea-pig, or, roughly, to 100 minimal lethal doses.—Pharm. Journ., Sept. 3, 1904, 377.

Antistaphylococcus Serum—Preparation, Etc.—According to Pröscher an efficient protective serum against living pathogenic staphylococci is obtained by the intravenous immunization of goats, sheep or horses with living virulent staphylococci. After repeated intravenous injections with staphylococcus culture the animals are allowed to rest from 2 to 3 weeks, when, after the drawing of the serum in the usual way, they are killed. The serum keeps well for a long time, but may be also preserved by the addition of 0.5 per cent. of phenol or tricresol. Neither subcutaneous nor intraperitonal injections, nor the sterilized filtrates from bouillon cultures, containing the soluble products of the staphylococci, are capable of yielding an active serum.—Pharm. Ztg., *49*, No. 87 (Oct. 29, 1904), 926; from Centralbl. f. Bakt., 1904, xxxvii, No. 2.

Syphilis Serum—Progress in its Production.—Dr. Piorkowski reports preliminarily on the progress made in the production, by the usual methods of innoculation and immunization, of syphilis serum, which appear to justify the belief that an innocuous and efficient serum for the treatment of syphilis is among the possibilities in the near future.—Pharm. Ztg., *50*, No. 4 (Jan. 14, 1905), 40; from Address to Berlin Med. Society.

Urine—Proposed Course to Secure Uniformity in Examinations.—A commission composed of F. Seiler, Dr. F. Schaffer and Dr. E. Schumacher, appointed by the Society of Swiss Analytical Chemists, has submitted the following scheme to secure uniformity in the pathological examinations of urine:

It is desirable that the physician shall indicate to the chemist the tests and determinations required, together with the total quantity of urine voided by the patient during 24 hours, and accompanied by an average portion of the total quantity, which should be supplied preserved with chloroform (2.5 Cc. per liter of urine). In the absence of specific instructions, the examination should embrace the following:

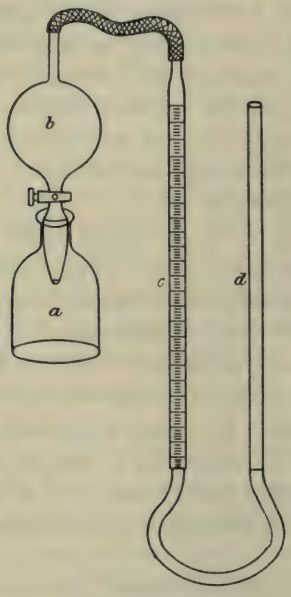
1. *Tests Always to be Made.*—A. Sensible tests: Color, odor, consistence, turbidity, sediment. B. Chemical and physical tests: Specific gravity, reaction, examination for albumen, sugar, indican, biliary acids, and, if turbid or sedimentary, microscopical examination.

2. *Tests and Determinations Depending on Contingencies.*—Estimations of albumen, sugar, urea, uric acid, acidity, residue of evaporation, mineral matter—such as lime and magnesia, phosphates, chlorides, sulphuric acid—and individual sugars; furthermore, tests for individual albuminoids (peptone, albumoses), acetone, acetic acid, indol, indoxyl, creatinine, etc.

This report of the commission is followed by brief explanations of the methods of analyses to be employed, which must be consulted, however, in the original communication in Schw. Wschr. f. Chem. u. Pharm., *42*, No. 39 (Sept. 24, 1904), 526–528.

Ureometer—Improved Form.—O. Wentzki describes the improved form of ureometer shown by Fig. 48, and the method of its use. The apparatus, which is 14 Cm. high and weighs when charged with urine and bromine solution about 50 Gm., consists of the flask *a*, of about 30 Cc. capacity, into the short neck of which a stoppered pipette (*b*), of about 10 Cc. capacity, is accurately fitted by grinding. In gravimetric urea determinations, 2 Cc. of urine and 5 Cc. of Knop's soda solution (28 per cent.

FIG. 48.



Ureometer.

NaOH) are introduced into the flask *a*, the pipette *b*, the ground surfaces of which are carefully greased, is inserted and, the cock being closed, it is filled by the aid of a small funnel with Knop's bromine solution (250 Cc. soda solution [28 per cent. NaOH] and 25 Cc. bromine freshly prepared under refrigeration). The pipette is then connected with the gas burette *c*, which is filled with mercury or water and the coincidence with the atmospheric pressure is established by lowering the leveling tube *d*—the connections of these several parts being effected by means of rubber tubing. The level of the mercury (or water) having been noted, the bromine is allowed to flow, preferably drop by drop, from the pipette into the flask, this operation being facilitated by careful raising and lowering of the leveling tube *d*. After all the bromine has been added, the apparatus is allowed to stand at rest for about 15 minutes, and the level of the liquids in the two tubes having been adjusted, the volume of nitrogen produced is ascertained, subject to correction for temperature, barometric pressure, tension of water vapor, etc., according to a formula laid down in the author's paper.—Pharm. Ztg., *49*, No. 84 (Oct. 19, 1904), 898.

Urine—Correction Scale for Uric Acid Process.—At the meeting of the British Pharmaceutical Conference in 1903, A. F. Dimmock, and F. W. Branson described a volumetric process designed particularly for the estimation of uric acid in urine (see Proceedings 1904, 982). Mr. Branson has since prepared a correction scale for this process, the divisions of which are intended for a gas volumeter graduated to a twentieth part of a cubic centimeter, and which renders the apparatus not only very suitable for the determination of uric acid, but also for urea, strength of hydrogen peroxide, etc. This correction scale, which is accompanied by directions for the correct reading of pressure and temperature, cannot conveniently be reproduced here, and must therefore be consulted in the original by those interested, in Trans. Brit. Pharm. Conf., (Year-book of Pharm.), 1904, 525–526.

Urine—Delicate Reaction for Uric Acid.—C. Frabot finds that a trace of uric acid, in the presence of excess of alkali, gives a fine blue color, resembling that of Fehling's Solution, with tungstic hydrate $WO_3.H_2O$, and with phospho-tungstic solution. Riegler has previously recorded a similar reaction with molybdenum, but according to the author it is much less intense than with tungsten, with which the presence of 1 : 100,000 of uric acid may be readily detected by means of phospho-tungstic reagent. The reaction may be employed to detect tungsten in certain minerals.—Pharm. Journ., Nov. 26, 1904, 773; from Annales de Chim. Analyt, *9*, 371.

Urine—Presence of Potassium Salts a Possible Source of Error in Albumen Determinations.—L. v. Itallie having obtained with Esbach's (picric acid) test for albumen a heavy precipitate which evidently was not albumen, found it on further examination to consist of potassium picrate, which he succeeded in crystallizing from hot aqueous solution. Inasmuch as the presence of larger quantities of potassium salts in the urine of fever patients is not uncommon, this should be taken into consideration when albumen determinations are made with picric acid.—Pharm. Ztg., *50*, No. 27 (April 5, 1905), 283; from Pharm. Weekbl., 1905, No. 9.

Urine—Convenient Test for Diabetic Sugar.—C. Strzyzowski finds that if 5 per cent. of official formalin is added to diabetic urine, a green fluorescent color is developed in the course of 24 to 48 hours in many cases, and of greater intensity in proportion to the content of metabolic substances (such as acetone, β-oxybutyric acid, acetacetic acid, etc.) in the urine. Numerous experiments have led the author to the practical assumption, that failure to obtain this reaction in the known presence of sugar, points out a mild form of diabetes, whereas the production of the reaction leads to the inference that the attack is a serious form. At higher temperature (50°–60° C.) the color reaction occurs more quickly, at lower temperatures (0°–10° C.) slower than at the ordinary temperature. The reaction is not traceable to the abnormal substances having

metabolic action.—Pharm. Ztg., *50*, No. 18 (Mar. 4, 1905), 189; from Therap. Monatsh., 1905, No. 2.

Urine—Detection of Indican.—G. Denigès proposes the following method for the detection of indican in urine, using a 5 per cent. solution of potassium chlorate as the oxidizing agent to reveal its presence: Four Cc. of the urine to be examined is treated in a test-tube, with 3 Cc. of hydrochloric acid, sp. gr. 1.17 to 1.18; 1 Cc. of chloroform and 1 drop of the above solution of potassium chlorate. The tube is then corked, and the contents well shaken up for a minute. Another drop of chlorate solution is then added, and shaken repeatedly for thirty seconds. If, after this, the separating chloroform is colorless or shows only the faintest bluish tint, indican is present only in normal quantity. Another drop of the reagent is then added, and the shaking repeated; the process continued drop by drop, until the color developed by the chloroform ceases to intensify, which generally occurs when five or six drops of chlorate solution have been added. The final color obtained is proportional to the quantity of indican present.—Pharm. Journ., Dec. 10, 1904, 854; from Bull. Soc. Pharm. de Bordeaux, 1904, *44*, 257.

Urine—Determination of Acetone.—Frommer and Lewy recommend for the detection of acetone in urine to add 1 Gm. of potassium hydroxide and 8–10 drops of salicyl aldehyde to the sample. In the presence of acetone, a dark-red to carmine red is developed. As the potassium hydoxide dissolves, a dark-red, then purple-red, and finally a black ring manifests itself. These changes result more rapidly by applying heat to 70° C.—Pharm. Ztg., *50*, No. 46 (May 6, 1905), 379; from D. Med. Wschr., 1905, No. 15.

Urine—Detection of Acetic Acid.—E. Riegler recommends the following method for the detection of acetic acid in diabetic urine: 15 Cc. of the sample is treated with 5 or 10 drops of strong sulphuric acid, followed by 2 or 3 Cc. of 6 per cent. hydriodic acid; in the presence of acetic acid a fugitive and more or less intense rose color is developed in proportion to the amount of acid present.—Pharm. Journ., Dec. 10, 1904, 854; from Bull. gen. de Thérap., 1904, *148*, 254.

Rubazonic Acid—A New Pathological Product.—Jaffé and Apert state that the red color observed in the urine of patients undergoing treatment with pyramidon is due to the presence of a new acid, rubazonic acid, $C_{20}H_{17}N_5O_2$; it has been obtained in crystalline needles, m. p. 184° C. by shaking out the colored urine with acetic ether. It is insoluble in water, dilute acids, sparingly soluble in boiling alcohol, but is dissolved by chloroform, acetic ether, benzene, and acetone. The coloring matter formed *in vitro* with pyramidon and urine on adding soda or nitric acid, is not identical with that produced in the organism. The appearance of this red color, which does not appear with all patients, is absolutely devoid of any pathological significance, being due neither to any toxic action of the drug, nor to any abnormal condition of the patient, as far as can be traced.—Pharm. Journ., Feb. 25, 1905, 269; from Répertoire, 1904, *16*, 538.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed $1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed $750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of $5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed $750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of twenty-three members, nine of whom, se-

lected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section* 1. The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insert on. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of membership for non-payment of dues shall be re-admitted only after having again made application in regular form—the application being accompanied by the usual fee.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any applications for membership made during the time between July 1 of one year and July 1 of the following year shall be considered as of the current fiscal year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *two successive years* he may be dropped from the Roll.

ARTICLE IV. Any member not in arrears to the Association, who shall pay to the Treasurer the sum of $100.00 during the first year of his connection therewith, or after ten years $75.00, or after fifteen years $50.00, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five Dollars*, to receive from the Treasurer a certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER VIII.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. At the fourth and fifth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE IX. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE X. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XI. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging

in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 7. The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

Section 8. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the persons nominated shall be balloted for.

Section 4. Reading of the Minutes of the Council.

Section 5. Reading of the Reports of the Treasurer and General Secretary.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. Incidental business.

Section 9. Adjournment subject to the call of the President.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER IX.

Of Committees.

ARTICLE I. There shall be appointed or elected nine Standing Committees as follows: a Committee on the U. S. Pharmacopœia and a Committee on Transportation, each to consist of ten members; a Committee on Time and Place of Meeting, a Committee on Commercial Interests and a Committee on Pharmaceutical Education and Legislation, each to consist of five members; a Committee on Scientific Papers, a Committee on Practical Pharmacy and Dispensing, a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers, at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the programme. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing, composed of members actually engaged in the retail drug business, shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose

suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association, as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE X. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

CHAPTER X.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed $300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

ARTICLE III. The Secretary of the Council shall also officiate as Secretary of the Committee on Membership.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:

a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.

b. Committee on Finance, three members.

c. Committee on Publication, five members.

d. Committee on Centennial Fund, three members.

3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901, 1903.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

Fourteenth, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

ENTERTAINMENTS AT THE FIFTY-THIRD ANNUAL MEETING.

The Committee of Arrangements very wisely took into consideration the fact that Atlantic City is itself wholly devoted to entertainments and recreation, being popularly called the Nation's Playground, and limited its efforts to a few special preparations chiefly designed for the entertainment of the visiting ladies. The customary reception of the President was held at the Hotel Islesworth on the evening of September 4th, being well attended, and as usual, much enjoyed. Besides arrangements for the free use of certain bowling alleys by all members of the Association, a special bowling tournament had been provided for the ladies at the Bowling Academy on Tuesday, September 5th, which elicited much spirited contest, and resulted in the bestowal of final honors upon Mrs. W. C. Anderson, of Brooklyn, N. Y. On Wednesday, September 6th, a most enjoyable reception and ocean trip was tendered by the Atlantic City Yacht Club, the visitors being taken in carriages from the hotel headquarters to the club-house, and thence in steam yachts for a couple of hours' rocking in the cradle of the deep blue ocean. Upon the return from this, to some, novel experience, refreshments were served, to which a sharpened appetite, heightened by the cool breezes of salt air, did ample justice. A morning concert on the Steel Pier on Thursday, September 7th, and a euchre party in the afternoon of the same day at the Hotel Islesworth, were especially designed for the entertainment of the ladies, while the gentlemen were engaged in discussing commercial and scientific problems, and at 10 p. m., at the close of one of the Section meetings, nearly all the visitors gathered in the ball-room of the Steel Pier to witness a cake-walk, especially arranged for their amusement.

In accordance with a resolution adopted at the Kansas City meeting, the Committee on Scientific Papers had arranged for a lecture on radium by Professor Charles Baskerville, of New York, which was delivered in a somewhat popular vein on Friday evening, September 8th, and proved to be the most pleasing entertainment of the week. Prof. Baskerville, who has done much important work with radio-active substances, and is thor oughly familiar with the investigations of other scientists in the same field, illustrated his remarks with numerous interesting experiments, and was greeted with frequent applause in recognition of the audience's apprecia-

tion of his efforts to explain the many causes and effects of the wonderful phenomena of radio-activity.

After adjournment of the general sessions of the Association, a large number of the members and their ladies remained for several days longer to enjoy more of the sea-bathing and the many attractions offered at the famous sea-side resort.

To the local secretary, Mr. W. C. Wescott and his amiable lady, Messrs. Deakyne, Cliffe, and others of the committee, many thanks are due for their untiring efforts in behalf of the visitors.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871.
Michael Carteighe, F. I. C., *London*, 1882.
Joseph Ince, F. L. S., *London*, 1882.
E. M. Holmes, F. L. S., *London*, 1899.

GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877.
Dr. Ernst Schmidt, Geh. Reg. Rath, *Marburg*, 1899.

INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

RUSSIA.

Johannes von Martenson, Staatsrath, *St. Petersburg* 1882.

ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPITALS. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Anniston.

Wikle, Jesse Lane 1898

Auburn.

Blome, Walter Henry 1903

Florence.

Darby, Marvin Henry 1904

Gadsden.

Cross, E. H. 1905

Mobile.

CANDIDUS, PHILIP CHARLES 1857
Eichold, Bernard Herbert 1905
Maguire, Edward Sylvester 1897
Van Antwerp, James Callanan 1905

Montgomery.

Knabe, Gustavus Alexander 1876

Prattville.

Scott, Clarence Alexander 1905

ARIZONA.

Phœnix.

Roziene, Robert Philip Mathias 1904

Prescott.

Brisley, Harry 1894

ARKANSAS.

Camden.

Morgan, Aylmer Lee 1890

El Dorado.

Appleton, William Riley 1901

England.

Carl-Lee, Reuben Bates 1903

Fort Smith.

Sparks, James Mitchell 1894

Gurdon.

Brown, John Cecil 1905

Helena.

King, Robert Bruce 1901

Hope.

Battle, Orrin McRee 1902

Hot Springs.

Klein, Ernest Frederick 1894

Little Rock.

Bond, John Barnitz 1883
Harvey, George Arthur 1903
Snodgrass, Latta Kavanaugh 1901

Pine Bluff.

Dewoody, William Lawrence 1887

Pocahontas.

Skinner, William Henry 1905

Reyno.

Martin, James. 1903

Searcy.

Robertson, Felix Otey 1890

CALIFORNIA.

Angel Island.

Mason, Myron Robinson 1904

Arcata, Humboldt Co.

Bohmansson, Robert Hugo 1901

Auburn.

Stevens, Frederick Solon 1903

Fullerton, Orange Co.

Kerr, William Whitman 1887

Los Angeles.

Kirkland, Derwentwater 1889

Napa.

Levinson, Joseph 1895
Shoults, Robert Grafton 1901

Ontario.

Jesson, Jacob 1872

Riverside.

Smith, Harley Earl 1903

Sacramento.

Lichthardt, George Henry Philip 1902

San Francisco.

Bayly, Charles Alfred 1889
Boulton, Emison Allen 1902
Boyken, John William 1902
Boyson, John Henry 1905
Brock, Gustavus Hamilton 1905
Calvert, John 1870
Dawson, John Henry 1882
Donohue, Henry 1903
Drossel, August Adolph 1902
Drucker, August Elisha 1904
Esters von Krakau, James Henry William 1897
Fletcher, David Maass 1904
Grazer, Frederick Augustus 1904
Jones, Philip Mills 1903
Jorgenson, Edward B. 1902
Miller, Charles 1897
Prior, Toney 1905
Schmidt, Valentine 1887
Schneider, Albert 1899
Searby, William Martin 1882
Sharp, Sol. Albert 1902
Smith, Edward Joseph 1903
Stange, Carl Frederick 1897
STEELE, JAMES GURDEN 1859
Wenzell, William Theodore 1870
Winter, James Harry 1904
Zabaldano, Alexander 1902

Vallejo.

Klotz, Gus. Oscar 1905

Woodland.

Elder, Herbert Percy 1903

COLORADO.

Central City.

Best, John 1886
Davies, Llewellyn Powell 1891

Colorado Springs.

Depeyre, Louis Noel 1894
Ward, Augustus Jae 1893

Cripple Creek.

Beitenman, William Wallace 1888

Denver.

Anglum, John 1902
Ford, Charles Mangan 1887
Hover, William Adgate 1895
Rupp, Harlan Estle 1904
Walbrach, Arthur 1881
Ward, Charles Edward 1904

Leadville.

Kolsch, Julius 1902
Nordlander, Anders Gustavus Emilus. 1905

Longmont.

Witting, Frederick Frank 1902

Pueblo.

Ford, Edgar Frank 1902
Taylor, George Edward 1895

COLUMBIA, DISTRICT OF.

Anacostia.

Weiss, Conrad Henry 1900

Washington.

Alexander, Charles Ellis 1899
Boyd, George Washington 1883
Bradbury, Wymond Henry 1895
Campbell, Charles Berger. 1902
Criswell, Francis McClure 1892
Duckett, Walter G. 1876
Easterday, Herbert Clifton. 1893
Elliott, Charles Houston 1899
Flemer, Lewis 1895
Franzoni, Joseph Dunbar 1900
Gordon, Frederick Troup 1900
Gross, Charles Ernest 1900
Henkel, Alice 1902

Henry, Frank Clinton....1894
Herbst, William Parker....1895
Hilton, Samuel Louis....1890
Holt, Edwin Merrimon....1902
Hoover, George William....1905
Hunt, Reid....1904
Hurlebaus, George William....1895
Jorgenson, Hans Christian....1899
Kalusowski, Henry E....1904
Kebler, Lyman Frederic....1894
Loussararian, Armenag Hovhannes...1905
Luve, Frank A. A....1902
Major, John Richards....1873
Martin, John Charles....1883
Milligan, John Dean....1900
Motter, Murray Galt....1904
Neeley, Guy Minick....1900
Phillips, Thomas Newkirk....1904
Quigley, Richard Lucien....1902
Richardson, Willard Stowell....1900
Richtmann, William Oscar....1904
Schreiner, Oswald....1900
Schulz, Henry Louis....1905
SIMMS, GILES GREEN CRAYCROFT....1860
Stevens, Edward....1903
Stott, Samuel Thompson....1900
Taylor, Augustus Carrier....1900
True, Rodney Howard....1904
Weller, Franklin Pierce....1900
Wiley, Harvey Washington....1902

CONNECTICUT.

Bethel.

Garvin, Patrick Joseph....1905

Bridgeport.

Hamilton, William Clinton....1902
Hartigan, Joseph Dennis....1902
Jamieson, George Alexander....1903
Leverty, John Augustine....1900

Danbury.

Dickinson, Arthur Lyman....1900

Danielson.

Morin, Ludger Joseph....1905

Hartford.

Duggan, James....1894
Rapelye, Charles Andrew....1876
Seinsoth, John Jacob....1900
Stoughton, Dwight George....1890
Williams, John Kirby....1875

Meriden.

Mosher, William Wooster....1894

Middletown.

Hartman, Frank Clayton....1905
Pitt, John Richard....1872

New Haven.

Fleischner, Charles....1905
Gessner, Emil Adolph....1878
Hodgson, Joseph Arthur....1903
Hogan, John Joseph....1890
Mix, Willis Lee....1896
Spalding, Warren Alphonso....1876
Wood, Alonzo Felton, Jr....1890
Wood, James Prior....1890

New London.

Daboll, Horace Hart....1903

Putnam.

Dresser, George Edward....1886

Stamford.

Finch, Charles Smith....1900

Waterbury.

Ebbs, John Buddington....1905
Newton, Clarke Henry William....1905
Wilcox, Levi....1903
Woodruff, Roderick Samuel....1876

DELAWARE.

Wilmington.

Watson, Herbert Kennedy....1888

FLORIDA.

De Land.

Fisher, George Washington....1893

Eureka.

Parramore, George Brinson....1904

Jacksonville.

Crum, John Darius....1892
Dixon, John Marion....1894
Jones, William Daniel....1903
Kirk, James Edgar....1903
Stewart, Harry Erson....1903

Key West.

Stier, Carl....1902

Lake City.

McCormick Louis Carlton....1903

Lakeland.

Cresap, Philip Pointer.....1904

Miami.

Abernethy, John Cocke 1904

Monticello.

Palmer, John Dabney 1902

Ocala.

Groves, Henry Conrad 1903

Palatka.

Ramsaur, David Wilfong 1902

Sarasota.

Brown, John Oliver.....1905

St. Augustine.

Smith, Lauriston Stephen.....1892
Speer, Charles Claude 1902
Woodman, Walter Irving 1893

Tallahassee.

Balkcom, Victor Franklin.....1903
Cox, Daniel Richard 1903

Tampa.

Berger, Ernest 1902
Casalius, Tsidro 1903
Hutchinson, Currie J. 1905
Itizarri, Miguel Pino 1903
Mosely, Lawrence Joseph.....1903
Quintanal, Benito Julian Fernandez ..1903
Riggio, Joseph 1903

GEORGIA.

Americus.

Dodson, James Glenwell.....1903

Atlanta.

Elkin, William Simpson 1905
Hood, Reuben Columbus 1902
Kelley, Ruben Benjamin 1905
Payne, George Frederick 1893
Pitts, William Burton 1903
Watson, Sidney Powell.....1887

Augusta.

Durban, Sebastian Charles 1883
LAND, ROBERT HENRY.....1859
Land, Robert Henry, Jr.....1902
Printup, Daniel 1903

Bowdon.

Lovvorn, James Lewis.....1897

Brunswick.

Smith, John Stovall 1903

Columbus.

Gann, Henry.....1903

Commerce.

Hardman, Lamartine Griffin.....1903

Dawson, Terrill Co.

Davidson, Edgar Cyrus.....1902

Elberton.

Cleveland, Julę Mattox 1902

Fitzgerald.

Goodman, John Hawkins.....1904

Greenville.

Culpepper, Thomas Jefferson 1903
Gilbert, Robert Bacon.....1902

Hawkinsville.

White, Howell Cobb 1903

Jeffersonville.

McCrary, Walter Homer.....1903

La Fayette.

Osborn, Edward Morton.....1904

Lyons.

Scarboro, Turner Augustus.....1903

Macon.

Brunner, Norman Isaac. 1878
Cheatham, Thomas Alexander.....1890
Hoge, John Sutherland.....1903
Lamar, Henry James.....1897
Morris, Max 1898

Rome.

Curry, David W. 1894

Savannah.

Rowlinski, Robert Antone 1892
Solomons, Isaiah Abram.....1894
Spangler, Lewis Clayton.....1902

Thomasville.

Montgomery, John Swift.....1904
Thomas, Robert, Jr.....1888

HAWAIIAN ISLANDS.

Honolulu.

Gibson, Frank Leighton.....1904
Pfluger, Henry Christian.....1903
RUMSEY, SAMUEL LOUIS 1876

IDAHO.

Boise.

St. John, Sidney Sylvester 1897

Emmett.

Smithson, David Elmer 1890

Lewiston.

Doehne, George, Jr. 1904

ILLINOIS.

Albion.

Michels, Victor Clyde 1902

Alton.

Riley, Cassius Marcellus 1901

Aurora.

Staudt, Louis Carl 1890

Barry, Pike Co.

Mercer, William Elmer 1902

Bloomington.

Garver, Christian 1905

Blue Island.

McPherson, George 1865

Cairo.

Metzger, Matthias Clyde 1902
Schuh, Paul Gustav 1894

Camp Point, Adams Co.

Bartells, George Case 1881

Carbondale.

Patten, Eustis 1900

Carlinville, Macoupin Co.

Loehr, Theodore Christian 1888
Steinmeyer, William Otto 1901

Chicago.

Adamick, Gustave Hattenhauer 1891
Avery, Charles H. 1905
Bartlett, Nicholas Gray 1861
Baur, Jacob 1879
Becker, Irwin Atwood 1905
Behrens, Emil Christian Louis 1893
BIROTH, HENRY 1865
Blahnik, Marie, Mrs. 1905
Boehm, John J. 1905
Bollinger, George 1905
Bruder, Otto Emil 1905
Bruun, Harold Nicolai 1905
Clark, Albert Henry 1905
Clothier, Charles Roland 1905
Cooban, Benjamin Slater 1902
Day, William Baker 1895
EBERT, ALBERT ETHELBERT 1864
Engelhard, George Pierre 1903
Fischnar, John Ferdinand 1905
Fisk, Frank Elmer 1902
Forsyth, William Kitchin 1902
Fry, Herman 1902
FULLER, OLIVER FRANKLIN 1869
Gale, Edwin Oscar 1857
Gale, William Henry 1857
Gordin, Henry Mann 1899
Gordon, Jean 1902
Grassly, Charles William 1884
Gray, Margaret McClintock (Mrs.) 1901
Gray, William 1892
Hallberg, Carl Swante Nicanor 1879
Harrison, William Henry 1905
Hartwig, Otto Julius 1892
Hermanek, Joseph Charles 1904
Hoelzer, Bruno Alfred Christian 1905
JAMIESON, THOMAS NEVIN 1903
Kahn, Harry 1903
Klenze, William Theodore 1905
Ladish, Erich Herman 1905
Lehman, Louis 1905
Lord, Thomas 1882
Manns, Albert George 1905
Mares, Frank Martin 1902
Martin, John Fraley 1905
Mathison, Soren 1905
Matthews, Charles Edwards 1893
McConnell, Charles Henry 1899
Miner, Maurice Ashbel 1880
Oglesby, Daniel George 1905
Oldberg, Oscar 1873
Patterson, Charles Waggener 1905
Patterson, Theodore Henry 1869
Pond, Raymond Haines 1903
Puckner, William August 1888
Rhode, Rudolph Ernst 1887
Roesch, Anton 1901
Rounds, Marvin Bird Cleo 1905
Runkel, Julia 1905
Schaper, Henry Frederick 1905
Scherer, Andrew 1884
Schmidt, Florian Charles 1882
Schmidt, Frederick Michael 1887

Schmitt, Walter 1904
Sills, Frederick William 1903
Snow, Clyde Mason 1903
Stahl, Amanda Wilhelmina 1903
Stephenson, Charles William 1902
Stimson, Charlotte Elizabeth 1905
Stolz, Otto G. 1905
Thorburn, Albert David 1902
Truax, Charles 1882
Turnquist, Carl Martin 1901
Valentine, William George 1905
Van Schaack, Cornelius P. 1905
VOISS, ARCADIUS 1901
Walter, Charles Albert 1899
WHITFIELD, THOMAS 1865
Wisdom, Hugh 1901
WOLTERSDORF, LOUIS 1865
Woods, Charles Henry Albert 1897
Wooten, Thomas Victor 1893
Zelinski, Walter Franz von 1905

Chicago Heights.

Michalek, John 1900

East St. Louis.

Knoebel, Thomas 1892

Geneseo.

Stamm, Dante Milton 1896

Girard, Macoupin Co.

Deck, Lewis Cass 1901

Greenup.

Conzet, Rufus Warren 1904

Moline.

Lindvall, Charles Gustaf 1897
Sohrbeck, George Henry 1888
Sohrbeck, George William 1897

Mount Vernon.

Bond, Jackson Newlon 1902
Morse, Edward Worth 1896

North Alton.

Barth, George Fred 1896

Oak Park.

McCauley, Charles Edward 1903

Pekin.

Ehrlicher, Henry Michael 1892

Peoria.

Benton, Wilber Merritt 1888
Lueder, Fritz 1894

Pesotum.

Hoffman, George Frederick 1902

Quincy.

Heidbreder, Albert Henry 1905

Springfield.

Dodds, Richard, Newton 1902

Stronghurst, Henderson Co.

Harter, Isaac Foster 1893

Tuscola.

Stacy, Marion Franklin 1903

Wilmette.

Gathercoal, Edmund Norris 1905

INDIAN TERRITORY.

Bokchito.

McAleer, Francis Alonzo 1904

Checotah.

Kniseley, Herman Dee 1905

Miami.

Matthews, Loderick 1903

Muskogee.

Cobb, Henry C. 1905
Cumberledge, Samuel Gibson 1904

Welch.

Kinnison, Virgil A. 1904

INDIANA.

Albion, Noble Co.

Miller, Chas. Elliott 1899

Angola.

Ritter, Clyde 1905
Sherrard, Charles Cornell 1893

Columbus.

Otto, Theodor Gotthelf Eduard 1900
Stahlhuth, Ernst Henry William 1887

Corydon.

Riely, Louis Stoy 1904

Evansville.

Van Ness, George Ide 1904

Fort Wayne.

Gross, William Otto 1901
Mertz, Edward Leander 1904
Woodworth, Charles Beecher 1900

Indianapolis.

Carter, Frank Henry.....1891
Eldred, Frank Randall.....1905
Field, Claud 1890
Frauer, Herman Emanuel 1881
Gertler, John Henry 1905
Huder, Henry J. 1894
Hurty, John Newell.....1882
Lilly, Josiah Kirby.....1890
Timberlake, Arthur 1902
Waddell, Minor T.....1899
Wolcott, Frank Elmer.....1902
Woolsey, Jesse Francis.....1903

Lafayette.

Glick, Harry Edwin.....1900
Schultz, John Jacob.....1904
Sturmer, Julius William 1901

La Porte.

Meissner, Frederick William, Jr. 1890

Logansport.

Hoffmann, George William 1904

New Albany.

Knoefel, Bruno 1896
Knoefel, Charles Deitrick.....1894
McDonald, Harry Stuart.....1905

New Carlyle.

Warner, Francis Delop.....1904

Sheridan.

Elliott, Cassius Eugene 1904

South Bend.

Bastian, Otto Carl 1903
Coonley, Charles 1902
Eliel, Leo 1883
Meyer, Martin Monroe 1897
Weiser, William Augustus 1904

Tell City.

Schreiber, Charles Christian Frederic August.....1901

Troy.

Gaesser, Theobald Theodore 1901

Valparaiso.

Heineman, Albert F.....1905
Roe, Joseph Newton.....1902
Timmons, George Demming.....1905

Warren.

Hickerson, William Henry.....1894

Winchester.

Sala, Albert Franklin 1905

IOWA.

Amana.

Koch, August Frank 1903
Schadt, Conrad.....1903

Boone.

Ridgway, Lemuel Augustus 1882

Charles City.

Legel, John Gotthelf.....1897

Cherokee.

Mikkelsen, Niels 1903

Clear Lake.

Etzel, John Leonhardt 1897

Davenport.

BALLARD, JOHN WINTHROP 1871

Des Moines.

Berner, Carl Albert 1903
Chittick, Justus Raymond.....1903
Dorsheimer, George Valentine.....1903
Downing Ernest Albert.....1903
Fifield, Winfield Clark.....1904
Henry, W. P. 1903
Higgins, Edward A. 1903
Howard, Fletcher, Mrs. 1905
Kinney, Charles Noyes 1901
Macy, Sherman Riley 1891
Rogg, Charles Walter 1903
Sandholm, John Alfred 1904
Smith, Oliver Vincent Richard 1903
Ulch, James Joseph 1903

Dubuque.

Torbert, Willard Horatio 1887
Witmer, Joseph Washington 1896

Essex, Page Co.

Eaton, Harry Ellsworth 1902

Fort Dodge.

OLESON, OLAF MARTIN. 1877

Fort Madison.

Schafer, George Henry. 1871

Harlan.

Pederson, George M.....1905

Homestead.

Miller, Frederick William. 1902

Iowa City.

Boerner, Emil Louis 1877
Shrader, William Edwin 1902
Teeters, Wilber John 1902

Keokuk.

Kiedaisch, George Arthur 1904

Mason City.

Burns, Edwin Miller 1897

Muscatine.

Halstead, Alice Louisa, Mrs 1892

Reinbeck.

Junger, William Frederick Franklin .. 1902

Sioux City.

Andreen, Carl. 1902
Koelle, Otto Charles 1902
Moore, Silas Harwood 1880
Scherling, Gustav 1884
Thelander, Cheston Carlos 1902
Thompson, Edwin Thomas 1902
Thompson, Joseph. 1902

South English.

Coffman, Walter Thomas 1904

Stuart.

Treat, Joseph Augustus. 1885

Unionville.

Allen, Earl 1905

Waterloo.

Wangler, Conrad David 1876

Winfield, Henry Co.

Lindly, John Milton 1901

KANSAS.

Atchison.

Cochrane, William Winston. 1904
Myers, Carvosso Oursler 1904
Noll, Mathias 1901

Council Grove.

Gregory, Charles Alfred 1904

Ellsworth.

Sherriff, William Ebenezer 1904

Gypsum City, Saline Co.

Schmitter, Jonathan 1892

Iola.

Evans, William Jesse 1904

Kansas City.

Ackenhausen, William Andrew 1904

Kingman.

Cookson, Joseph Wesley 1902

Lansing.

Shudrowitz, Frank Stanislas. 1904

Lawrence.

Havenhill, L. D. 1900
LEIS, GEORGE 1869
Moore, John Thomas 1888
Sayre, Lucius Elmer 1883

Manhattan.

Engel, Carl 1904

Morton.

Montgomery, Harriet Evans 1903

Onaga.

Kester, Joseph A. 1904

Ottawa.

Becker, Charles Lewis 1892

Overbrook.

Topping, Arthur Ellsworth 1904

Paola.

Oyster, John Houck 1904

Topeka.

Holliday, Francis Emlen 1900
Snow, Frederick Asbury 1904

Wichita.

Henrion, Walter S. 1904

Wilmore.

Sombart, John Edward 1881

Winfield.

Friedenburg, Maximilian Wilmer 1904

KENTUCKY.

Covington.

Pieck, Edward Ludwig 1887
Willenbrink, Charles Anthony 1904
Zwick, Karl George 1899

Cynthiana.

Berry, Robert Henry 1903

Frankfort.

Gayle, John William 1891

Lexington.

Hall, Alexander 1904
Harting, Rudolph R. 1902

Louisville.

Bell, Emil Remigius 1899
Curry, Gordon Laten 1900
DIEHL, CONRAD LEWIS 1863
Dilly, Oscar Charles 1888
Dimmitt, Addison 1895
Jones, Simon Newton 1870
NEWMAN, GEORGE ABNER 1866
Overton, Burr Martin 1903
Peter, Minor Cary 1894
Schiemann, Edward Bernard 1880
Schlosser, Peter 1902
Schoettlin, Albert John 1882
Troxler, Constantine, Jr. 1896
Votteler, William 1895

Newport.

Bange, Otto Franz 1904
Greule, Albert Martin 1903

Paris.

Clarke, Charles Jordon 1904

Richmond.

Stockton, Robert Curtis 1903

Somerset.

Potter, Chilton Scott 1882

LOUISIANA.

Baton Rouge.

Maguire, Thomas Joseph 1905

Brusly Landing.

Sarradet, Atal August 1905

Covington.

Claverie, Joseph Stanislaus 1904

Jennings.

Richard, Valleix Bernard 1905

Monroe.

Allen, William Everett 1905

New Iberia.

Boutte, Armand Virgil 1904
LEE, JAMES AUGUSTIN 1856
Quirk, Edmond Charles, Jr. 1904

New Orleans.

Adams, James Ogilvie 1904
Asher, Philip 1905
Breslin, Michael Thomas 1905
Brown, George Stewart 1900
Capdau, Pierre August 1902
Castillon, Louis Albert 1904
Davis, George Bowditch 1904
Dicks, Frederick Augustus 1905
Dunn, Joseph Henry 1903
Earhart, Frederick A. 1904
Finlay, Alexander Kirkwood 1883
Godbold, Fabius Chapman 1887
Guidry, Ambrose Joseph 1903
Henne, Louis E. 1905
Jacobs, Charles Christian 1901
Katz, Gustave 1903
Killeen, William Patrick 1904
Larsen, John Thomas 1904
Legendre, Joseph Amilcar 1891
Levy, William Michael 1894
Lyons, Lucien Eugene 1904
Magruder, Charles Galloway 1904
Marion, Etienne James 1903
Metz, Abraham Lewis 1887
Monsabert, Arthur Charles de 1905
O'Gorman, Theophilus Vincent 1897
Posey, Henry Gibbon 1905
Quin, Frank Woodard 1902
Richardson, Samuel William 1897
Richardson, Thomas William 1904
Samson, Max 1900
Sauvinet, Charles Daniel 1902
Villere, Rene Louis 1905
Walsdorf, Charles Albert 1904
Walsdorf, Edward H. 1904
Weilbaecher, Frank Eugene 1904
Wirth, Adam 1904
Wunderlich, Edward 1891

Plaquemine.

Hiriart, Sebastian 1891

Point Coupee.

Hebert, Joseph Henry 1905

Pollock.

Bonnette, James Valarus.....1902

Shreveport.

Bernstein, Michel.....1902

White Castle.

Capbern, Andrew E. 1903

MAINE.

Auburn.

Burnham, Ralph Foster 1904
Jones, Oscar Winthrop 1902

Augusta.

Partridge, Frank Reuben 1895

Bangor.

Davis, Charles Howard.....1903
HARLOW, NOAH SPARHAWK 1859
Sweet, Caldwell 1881

Bath.

Anderson, Samuel 1876

Biddeford.

Boynton, Herschel.....1875
Traynor, Charles Francis.....1902

Danforth.

Porter, Martin Luther.....1904

Kennebunk.

Meserve, Albert Wesley.....1905

Lewiston.

Lowell, Edward Mark.....1896
Parmalee, Walter Woodruff. 1901
Sanford, John Foy. 1902

Livermore Centre.

Leavitt, Adoniram Judson 1905

Orono.

Jackman, Wilbur Fisk.....1899

Portland.

Cook, Alfred Page. 1902
Drew, Walter Israel 1896
Frye, George Carlton 1879
Hay, Edward Allston 1889
Morse, Frank Dana.....1902
Perkins, Benjamin Abbott.....1878
Rand, Daniel Moulton.....1892
Schlotterbeck, Augustus George 1896

Saco.

Sawyer, Charles Henry. 1896

York Village.

Sanford, John Foy.....1902

MARYLAND.

Annapolis.

Henkel, Charles Bernard.....1902

Baltimore.

Barnett, Joel Jones 1899
Base, Daniel.....1898
Brack, Charles Emil 1876
Brickman, Arthur Otto 1898
Burrough, Horace 1883
Burrough, Horace, Jr.....1901
Campbell, William Lusk.....1905
Caspari, Charles, Jr.....1883
Corning, Albion James 1898
Culbreth, David Marvel Reynolds....1883
Davis, John Alexander 1894
Dohme, Alfred Robert Louis.....1891
DOHME, CHARLES EMILE 1863
DOHME, LOUIS.....1859
Dunning, Henry Armitt Brown.....1902
ELLIOTT, HENRY ALEXANDER 1859
EMICH, COLUMBUS VALENTINE 1863
Feick, Charles.....1901
Frames, John Fuller.....1890
Gilpin, Henry Brooke.....1889
HANCOCK, JOHN FRANCIS. 1863
Hengst, John Edwin 1900
Heiusler, Philip Ignatius.....1903
Hynson, Henry Parr..... 1890
Kelly, Evander Frank.....1905
Kornmann, Henry. 1899
Kosminsky, Leon Joe.....1902
Maisch, Henry 1898
Mansfield, Samuel 1898
Meyer, Adolph Carl.....1905
Meyer, Charles Louis 1901
Millard, David Rockwell.....1899
Morgan, Charles 1899
Muth, George Louis.....1894
Muth, John Clement 1898
Muth, John Sebastian 1898
Nance, Fuller 1905
Schulze, Louis 1892
Schumann, Otto George 1902
Scott, Edgar Burroughs.....1905
Sharp, Alpheus Phineas 1855

Simon, William 1885
Smith, Theodoric 1890
Stuart, William Alexander 1898
Ware, Charles Howard. 1898
Westcott, James Walling 1890
Williamson, Robert Edward Lee 1898
WINKELMANN, JOHN HENRY 1864
Wolf, James Carlton 1905

Brookeville.

Howard, Henry. 1905

Chestertown.

Toulson, Milbourne Asbury 1905

Cumberland.

Elderdice, William James. 1902

Hagerstown.

Aughinbaugh, David Culbertson 1898
Meredith, Harry Lionel 1900
WINTER, JONAS 1863

Hancock.

Hook, James Patrick. 1905

Roland Park.

Bacon, Ephraim 1905

Snow Hill.

Powell, William Cottingham 1895

Taneytown.

McKinney, Robert Sentman 1898

MASSACHUSETTS.

Boston.

Baird, Julian William 1894
BASSETT, CHARLES HARRISON. 1867
Burnham, Alfred Augustus, Jr. 1891
CANNING, HENRY 1865
Capper, William Ernest 1892
Carter, Frederick Louis 1905
Colton, James Byers 1865
Cramer, Max 1881
Doliber, Thomas. 1859
DRURY, LINUS DANA. 1871
Durkee, William Carley 1885
Flynn, Cornelius Paul 1904
Godding, John Granville 1875
Jaynes, Charles Porter 1905
Jaynes, Charles William 1905
Jones, James Taber 1875
Lauricella, Felice 1896
Lewis, Ernest Grant 1892
Patton, Ichabod Bartlett 1858
Pfaff, Franz. 1899
Pierce, William Herbert 1879
Sawyer, William Frederick 1885
Scoville, Wilbur Lincoln 1891
Sharples, Stephen Paschell 1875
SHEPPARD, SAMUEL AIRUS DARLINGTON. 1865
Simonson, Louis. 1904
Small, Herbert Elwyn 1901
Smith, Linville Holton 1892
Stowell, Daniel 1875
Tilden, Amos Kendall 1892
Tucker, Greenleaf Robinson 1890
Vargas-Heredia, Jorge 1891
Varney, Edward Francis 1892
Wells, Edwin Herbert 1893
West, Charles Alfred 1892
Wheeler, William Dexter 1892
Williams, George Gorham 1888
WILSON, BENJAMIN OSGOOD. 1859

Brockton.

Randall, Frank Otis 1893

Cambridge.

Chipman, Gilbert Swett. 1903
Claflin, Walter Addison. 1896
Phillips, Carrie Elizabeth 1894
Seaverns, Martha Gilbert 1902

Cambridgeport.

La Pierre, Elie Henry 1892
Norton, George Edward 1895
ORNE, JOEL STONE 1859

Charlestown.

Cowan, John 1897
STACEY, BENJAMIN FRANKLIN. 1860

Chelsea.

LaGrange, John V. 1905
McKay, Malcolm 1905

Concord.

Richardson, Horatio Stillman 1892

East Weymouth.

Hoyt, George Melvin 1904

Fairhaven.

Snow, Levi Morton 1905

Fall River.

Riddell, Benjamin Franklin 1892

Fitchburg.

Day, Edward John.....1901
Estabrook, Henry Arthur.....1886

Holyoke.

Ball, Charles Ely.....1885
Heinritz, Lebrecht Gustav.....1902

Hyde Park.

Reemie, Edgar Warren.....1905

Jamaica Plain.

Ernst, Frank Frederick.....1891

Lawrence.

Glover, William Henry.....1891

Leominster.

Nixon, Charles Frederic.....1900

Lowell.

Bailey, Frederick.....1869
Butler, Freeman Hall.....1874
Hood, Charles Ira.....1871
Thomasson, Anders.....1892

Malden.

Keaney, James John.....1899

New Bedford.

BLAKE, JAMES EDWIN.....1866
SHURTLEFF, ISRAEL HAMMOND.....1875

Newburyport.

Castlehun, Karl.....1902
Davis, Charles Leland.....1897
Goodwin, William Wells.....1853

Newton.

Crowdle, John Edward.....1894
Hudson, Arthur.....1882

Raynham.

Crossman, George Alvin.....1872

Salem.

Nichols, Thomas Boyden.....1876
Price, Charles Henry.....1882
Price, Joseph.....1888

Shelburne Falls.

Baker, Edwin.....1875

Springfield.

Adams, Henry.....1904

Stoneham.

Patch, Edgar Leonard.....1872
Ward, Charles Abraham.....1891

Waltham.

Gleason, Patrick Sebastian.....1904

Worcester.

Brewer, Howard Dickinson.....1902
Cutler, Bertram Crocker.....1905
Guerin, James Francis.....1898
Harris, Francis Mason.....1894
High, Raymond Lightcap.....1902
Scott, George Theodore.....1883

MICHIGAN.

Ann Arbor.

Calkins, Eleazer E.....1903
Eberbach, Ottmar.....1869
Schlotterbeck, Julius Otto.....1888
Stevens, Alviso Burdette.....1885

Battle Creek.

Erwin, Sid. A.....1904

Berrien Springs.

Kephart, Philip.....1902

Big Rapids.

Heath, George Millard.....1903

Cadillac.

Webber, Arthur H.....1903

Coldwater.

Lyon, Arthur George.....1903

Corunna.

Reidy, Michael.....1894

Detroit.

Allen, William Humphries.....1902
Burke, William Henry.....1902
Dillon, William Edmund.....1903
Famulener, Lemuel William.....1902
Hall, William Alanson.....1888
Helfman, Joseph.....1894
Houghton, Elijah Mark.....1899
Iltis, George Washington.....1905
Knox, James Wesley Thompson.....1898
Lyons, Albert Byron.....1885
MacFadden, Warren Lester.....1902
Mann, Charles Frederick.....1903
Mason, Harry Beckwith.....1896
Nelson, Edwin Horatio.....1904

Ohliger, Willard.....1903
Perry, Frederick William Riley.....1885
Ryan, Frank Gibbs 1892
Seltzer, Leonard Adams 1899
Stearns, Frederick 1897
Vernor, James.....1866
Walker, Alfred Levi.....1903

Flushing.

Sprague, Wesson Gage 1895

Grand Rapids.

Baert, George Henry 1903
Beukema, James Alfred 1903
Dutmers, Cornelius John.....1905
Kirchgessner, William Carl.....1903
Muir, John Davidson 1903
Peck, Percy Seaman 1903
Schmidt, Walter Karl 1903
Stowe, Ernest A. 1904
Timmer, Jacob Berend 1904

Ionia.

Gundrum, George 1882

Kalamazoo.

Todd, Albert May 1885

Monroe.

Hagans, Daniel Allen.....1903

Pontiac.

Cloonan, Martin John 1904

Saginaw.

Heim, Henry 1900
Prall, Delbert Elwyn 1902

MINNESOTA.

Avoca.

Bachman, Gustav.....1905

Duluth.

Abbett, William Allen.....1901
LeRicheux, Alfred Charles.....1901
Sweeney, Robert Ormsby.....1866

East Grand Forks.

Kingman, Ignatius.....1904

Fort Snelling.

Riess, Herman William 1903

Jackson.

Bailey, Leon.....1904
Colby, Charles Ludwig.....1904

Mankato.

Weed, Nelson. 1905

Minneapolis.

Allen, E. Floyd.....1885
Danek, John Francis. 1895
Gamble, Stewart.....1897
Huhn, Charles Hugo.....1905
King, George Alexander Newton. 1892
O'Connell, Charles John.....1903
Sweet, William Herbert 1905
Thompson, Albert Delano 1895
Voegeli, Thomas 1905
Wanous, Josephine Anna.....1897
Wittich, Matthew Henry.....1897
Wulling, Frederick John.....1893

New Ulm.

Alwin, William Gustav.....1904
Eckstein, Andrew Joseph 1895

Ortonville.

Nielson, John. 1897

Pelican Rapids, Otter Tail Co.

Axness, Ole Mikkelson 1895

St. Paul.

Campbell, Albert Alexander. 1902
Collier, William Kelly.....1897
Drechsler, Frank Xavier.....1902
Frost, William Arthur.....1892
Parker, Frederick M. 1902
Schumacher, Albert John 1904

Two Harbors.

Elfstrand, Wilhelm 1905

Warren.

Whitney, Edgar Francis 1897

Winona.

Lauer, Joseph William 1904
Leeb, Theodore Feargod.....1903

MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William. 1883

Biloxi.

Thurston, Edwin Joseph.....1904

Columbus.

Caine, S. Lee.....1904

Ellisville.

Hyde, Milton Warren.....1905
Ward, Enoch James.....1905

Hattiesburg.

Dozier, William Alney.....1905
Metcalfe, Alexander Hamilton 1905
Siebe, Henri Ozias.....1903

Holly Springs.

Barry, Augustus Franklin.....1904

Laurel.

Polk, Martin Luther.....1904

McComb City.

Fly, Anthony 1905

Meridian.

Bethea, Oscar Walter 1902
Hammond, E. Emmet.....1905
Hamrick, Charles Bee.....1905
Holt, Julian Woods.....1905
Humphries, John Randolph 1905
Perkins, John Seymour. 1904
Renfroe, Harris Burt. 1904

Oxford.

Faser, Henry Minor.....1904

Port Gibson.

Shreve, John Alexander 1880

Tchula.

Alexander, John Mills.....1905

Waynesboro.

Slaughter, Thomas Oslin.....1904

Woodville.

Birdsong, Lafayette Felix.....1904

MISSOURI.

Boonville.

Mittelbach, William.....1891

Carrollton.

PETTIT, HENRY MCEWEN.....1860

Centralia.

Hope, Robert Lee. ... .1901

Clayton, St. Louis Co.

Greensfelder, Harry.....1904

Excelsior Springs.

Rowell, Samuel Jackson. 1903

Jefferson City.

Brandenberger, Adolph..... 1894

Joplin.

Sterett, Walter Benjamin.....1903

Kansas City.

Breunert, August 1901
Cary, Silas Brown.....1903
Crampton, Ferd Leslie.....1896
Davis, Harry Roy.....1904
Dickey, Charles Francis 1904
Eyssell, George.....1889
Federmann, William Martin.....1901
Griffiths, Joseph 1901
Hess, Paul Ludwig 1892
Lawson, Charles Emil.....1903
Lee, Richard Henry.....1904
Liersch, Clemens 1903
Mente, Alvin William.....1901
Reymond, John Paul. 1903
Vincent, Frederic Arthur Charles 1904
Whitney, David Victory 1903
Wirthman, John George 1903
Wirthman, Joseph Charles 1903
Zinn, Charles Edward 1903

Maryville.

Orear, Edwin George. 1904

Mexico, Audrian Co.

LLEWELLYN, JOHN FREDERICK 1867

Nevada.

Ballagh, Wilfred Thomas 1901
Pierce, Fred.....1903

New Madrid.

Hummel, John Andrew 1901

Plattsburg.

Carmack, George Ward 1903

Sedalia.

Bard, William Evans.....1901
Dow, John P.....1904
SMITH, OTIS WILMER.....1903

St. Louis.

Ambrose, Olney Alphonso 1903
Angermueller, William Frederick 1903
Bartmer, Adolph Henry 1901
Bausch, Oscar Franz 1903
Blakeslee, Louis G. 1903
Blank, Alois 1881

Boehm, Solomon 1871
Boesewetter, Richard 1902
Caspari, Charles Edward 1902
Claus, Otto Ferdinand 1901
Collins, Albert Noel 1905
Duering, Henry Charles 1901
Euler, Frederick Christopher 1901
Falk, John Charles 1900
Fischer, John Frederick Henry 1901
Frerichs, Frederick William 1901
Fricke, Frederick Henry 1901
Gietner, Charles 1905
GOOD, JAMES MICHENER 1871
Grewe, Louis Frederick 1901
Hagee, William Price 1901
Hagenow, Theodore Frederick 1901
Hahn, Charles William John Henry .. 1901
Hemm, Francis 1881
Hinton, Rufus Guy 1905
Ilhardt, William Kellermann 1901
Ittner, William Frederick 1903
Johnson, Fletcher Vernon 1903
Judge, Charles Rogers 1901
Kleinschmidt, Augustus Anton 1903
Klie, George Henry Charles 1878
Koeneke, Charles Henry 1901
Kurtz, Irving William 1904
Lamar, William Robinson 1901
Lamont, William Hamilton 1903
Lester, Leon Thomas 1903
Mallinckrodt, Edward 1869
May, Charles Charlotte 1898
Merrell, George Robert 1901
Merrell, Hubert Spencer 1903
Merrem, Charles Daniel 1901
Meyer, Theodore Frederick 1901
Morgan, Thomas, Jr. 1905
Noll, Martin James 1898
Pauley, Frank Charles 1879
Philibert, Leon David 1901
Queeny, John Francis 1905
Reilly, Robert Charles 1901
Riley, Russell 1901
SANDER, ENNO 1858
SCHEFFER, HENRY WILLIAM 1863
Schlueter, Robert Ernst 1904
Schoenthaler, John Paul 1901
Seitz, Lorenz Aloysius 1901
Sennewald, Emil August 1900
Stolle, Henry Jasper 1903
Sultan, Frederick William 1901
Sum, Francis 1904
Suppan, Leo Richard August 1904
Temm, William Daniel 1901
Tontz, George Washington 1901
Uhlich, Ferdinand Gottlieb 1881
Vitt, Rudolph Simon 1895
VORDICK, AUGUST HENRY 1874
Walbridge, Cyrus Packard 1901
Wall, Otto Augustus 1884
Wall, Otto Augustus, Jr. 1903
Weber, Peter John 1901
West, Courtney Hughes 1902
WHELPLEY, HENRY MILTON 1887
Whitcomb, Frederick Ezekiel 1888
Wolf, Henry Adam 1901
Wolff, Edward Henry 1901
Wurmb, Theodore Henry 1890

Warrensburg.

Murray, Julius Victor 1905
Sorency, Robert 1903

Washington.

Gallenkamp, Edward William 1903

Webb City.

Wade, Guy Leland 1905
Wright, Charles Lewis 1901

Webster Groves, St. Louis Co.

Mueller, Ambrose 1894

Williamstown.

Felker, Walton Arthur 1904

Windsor, Henry Co.

Wesner, Henry Clay 1901

MONTANA.

Butte.

Rockefeller, Howard 1900

Great Falls.

Wicks, Jesse Harrison 1903

Havre.

Boon, Peyton Terry 1904
Burruss, Morris 1904

Livingston.

Scheuber, Frank Augustus 1905

NEBRASKA.

Auburn.

Dort, Edward Harvey 1903

Beatrice.

Harper, Harry Leroy 1903

Beaver City.

Hopping, Charles Edward 1903

Fairbury.

Pease, Autumn Vine 1893

Holdrege.

Fink, Daniel Jacob 1903

McCook.

McConnell, Lewis William 1904

Norfolk.

Grauel, Otto Henry 1903

Omaha.

Kendall, John Lee 1903
Mares, Ferdinand Louis 1897
Myers, Preston B. 1897
Ryerson, Maurice Walter 1903
Searson, Edwin Aaron 1904
Sherman, Charles Rollin 1889

Plattsmouth.

Fricke, Frederick George 1903

St. Paul.

Wilson, Elmer Lee 1903

Superior.

Kendall, Wallace Warren 1903

NEW HAMPSHIRE.

Berlin.

Lyford, Earle Howard 1903

Dover.

Rollins, John Francis 1859

Littleton.

Robins, Wilbur Fiske 1892

Portsmouth.

Grace, William Day 1896
Green, Benjamin 1888

Somersworth.

Hurd, John Charles 1892

West Derry.

Bell, Samuel Howard 1890

NEW JERSEY.

Atlantic City.

Deakyne, Harry Hartup 1905
Ridgway, William Frederick 1902
Wescott, William Carter 1896

Bernardsville.

Squibb, Charles Fellows 1901

Bridgeton.

Dare, Charles Ford 1889
Jorden, Henry Albert 1902
Whipple, George Henry 1902

Camden.

Barrett, Charles Llewellyn 1902
Beringer, George Mahlon 1893
Beringer, George Mahlon, Jr. 1905
Weiser, William Peiffer 1902

East Orange.

Stewart, Francis Edward 1884
Williams, Seward Whiting 1887

Elizabeth.

FROHWEIN, RICHARD 1867
Kent, Henry Avery, Jr. 1880
Oliver, William Murray 1875
Schmidt, Henry 1904
Stutzlen, Frank Charles 1902

Freehold.

Lehritter, George Peter 1902

Haddonfield.

Willard, Rowland 1902

Hoboken.

Brewer, Justin Sewall 1903
KLUSSMANN, HERMANN 1876
Sieker, Ferdinand August 1893

Jersey City.

Abernethy, Maxwell 1865
Foulke, James 1881
Gallagher, John Charles 1893
Lohmann, Herman J. 1896
Stein, Edward Theodore North 1902

Jersey City Heights.

Bongartz, Ferdinand Alphonse 1905
Kuehne, Charles 1902

Keyport.

Walling, Rufus Ogden 1903
Warn, William Edgar 1886

Lakewood, Ocean Co.

Harrison, William John 1896

Linden.

Dougherty, Samuel Edward..... 1875

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Montclair.

Wrensch, Henry Ernest, Jr..... 1902

Morristown.

CARRELL, EUGENE AYRES 1875

Newark.

Bear, Pierce B..... 1905
Betzler, Jacob..... 1880
Coleman, John H..... 1902
Drescher, August..... 1905
Eckert, John..... 1902
Egge, Julius Carl 1905
Foster, John Benjamin 1901
Hain, Frank William August... 1905
HOLZHAUER, CHARLES..... 1873
Menk, Charles William..... 1898
Smith, Clarence Pennington..... 1890
Staehle, Louis Lorenz 1898
Stamford, William Harrison..... 1876
Van Winkle, Abraham..... 1871
Wuensch, Charles..... 1898

New Brunswick.

Kilmer, Frederick Barnett 1886
Rust, Schuyler Stott..... 1905

Orange.

Sayre, Edward Augustus..... 1877

Paterson.

Mackey, James Campbell 1905

Perth Amboy.

Parisen, George Warren 1892
Seaman, Frederick A..... 1905

Phillipsburg.

Anewalt, Ellsworth Quincy..... 1901

Plainfield.

Ollif, James Henry..... 1867

Red Bank.

Van Derveer, Robert Hutchinson 1903

Shrewsbury.

Hazard, Elmer Clarke..... 1902

South Amboy.

JACQUES, GEORGE WASHINGTON..... 1869

Union Hill.

Neu, Daniel Alfred 1903

Verona, Essex Co.

Rich, William Pitt. 1902

NEW MEXICO.

Fort Bayard.

Hammar, Alrick..... 1897

Fort Stanton.

Beck, Julius Edward 1904

Santa Fe.

Fischer, Adolph Jacob..... 1904

NEW YORK.

Albany.

Bradley, Theodore James. 1896
Bradt, Warren Lansing. 1903
Dillenback, Garett Van der Veer. 1902
Gaus, Charles Henry. 1879
Huested, Alfred Birch..... 1879
Michaelis, Gustavus..... 1882

Auburn.

Adams, Arthur Ellison..... 1902

Binghamton.

Nelson, Burt Everett. 1902

Brooklyn.

Anderson, William Christine 1900
Bartley, Elias Hudson..... 1893
Brooks, George Washington. 1879
Brundage, Albert Harrison..... 1892
DeForest, William Pendleton..... 1879
DeJonge, Cornelius 1899
Dewender, William Henry..... 1896
Dissosway, Thurston S..... 1905
Douglas, Henry. 1875
DUNN, JOHN AUGUSTUS. 1867

Eccles, Robert Gibson.....1885
Eckler, Charles Ralph.....1903
Englander, Samuel.....1899
Fischer, Albert.....1904
FOUGERA, EDMUND CHARLES HENRY.1890
Hereth, Franklin Samuel.....1893
Kleine, Oscar Clemens, Jr.....1903
Levy, Adolph.....1877
Lo Sardo, Antonino.....1902
Maass, William Frederick.....1903
May, Louis.....1902
Mayer, Joseph L.....1905
McElhenie, Thomas DeArmond.....1872
McMahon, Joseph.....1897
OWENS, RICHARD JOHN.....1860
Raubenheimer, Otto.....1902
Remington, Joseph Percy.....1901
Rosenzweig, Benjamin.....1898
Schaffer, Charles.....1903
Schmidt, Ferdinand Traugott.....1886
Snyder, Ambrose Chancellor.....1867
Tuthill, Frederic Percival.....1899
Waldner, Paul Jacob.....1900
Webber, Joseph LeRoy.....1886
Werner, Rudolph Carl.....1882

Buffalo.

Bentz, Henry George.....1904
Dimond, Harry John.....1904
Gregory, Willis George.....1886
Hayes, Horace Phillips.....1880
Rano, Charles Orlando......1866
Reimann, George.....1902
Stoddard, Thomas.....1900

Catskill.

Du Bois, William Laneman.....1880

College Point.

Hartz, Johann Daniel August.....1902
Klein, Edward Nichols Emil.....1905

Corning.

Cole, Victor Le Roy.....1890

Croton-on-Hudson.

Henry, Charles (Dworniczak).....1881

Dunnemora.

Sloss, Robert Audley.....1901

Dunkirk.

Davis, Eugene Miller.....1892

Ellis Island.

Macdowell, William Foster.....1904
Neves, George.....1904

Elmira.

HOLMES, CLAYTON WOOD.....1873

Fishkill-on-Hudson.

Moith, Augustus Theodore.....1860

Flushing.

Hepburn, John.....1873

Geneseo, Livingston Co.

Rogers, Arthur Henry.....1882

Jamaica, Queens Co.

Goodale, Harvey Galusha.....1879
Peck, George Lyman.....1883

Middletown.

KING, JAMES THEODORE.....1859
Rogers, William Henry.....1869
Shimer, Samuel Mortimer.....1904

Monticello.

Isakovics, Alois von.....1905

Mount Vernou.

Blackmore, Henry Spencer.....1896
Rauschenberg, Sidney.....1900
Stone, Clarence George.....1901

New York City.

Allison, William Outis.....1895
Alpers, William Charles.....1890
Amend, Bernard Gottwald.....1892
Aquaro, Joseph.....1900
Balser, Gustavus.....1875
Bigelow, Clarence Otis.....1900
Billings, Henry Merry.....1869
Boeddiker, Otto.....1895
Brucker, Carl Friederich Jacob.....1902
Brunor, Emile.....1904
CHANDLER, CHARLES FREDERIC.....1867
Coblentz, Virgil.....1882
Cohn, Alfred I.....1905
Cook, Thomas Penrose.....1877
Coté, Andre Alexander.....1904
Daggett, Volney Chapin.....1901
Diamond, Peter.....1905
Diekman, George Charles.....1898
Duble, Jesse Balderston.....1904
Eaton, Harvey K.....1902
Evans, William James.....1904

Faber, Walter Eberhard.....1900
Fairchild, Benjamin Thomas.....1875
Fairchild, Samuel William.....1887
Feinberg, Maurice Mandel.....1905
Ferguson, George A.....1905
Flowers, Hiland.....1904
Fraser, Horatio Nelson.....1888
Gable, Ralph Benton.....1902
Gahn, Henry.....1902
Gane, Eustace Harold.....1895
GARDNER, ROBERT WINSLOW.....1867
Geisler, Joseph Frank.....1889
Geisler, Leo Waldemar, Jr.....1904
Green, Edward T.....1905
Gregorius, George Gustavus Chas. Wm.1898
Haddad, Saleem Faris.....1902
Harris, Norman B.....1904
Hatcher, Robert Anthony.....1905
Hauenstein, William.....1883
Haynes, David Oliphant.....1887
Hays, Francis Banks.....1902
HEYDENREICH, EMILE.....1867
Hitchcock, George Henry.....1902
Hopkins, Jesse L.....1898
Hudnut, Richard Alexander.....1899
Jelliffe, Smith Ely.....1895
Jungmann, Julius.....1879
Kalish, Julius.....1875
Kalish, Oscar G.....1900
Keenan, Thomas John.....1894
Kemp, Edward.....1903
Kennedy, Ezra Joseph.....1887
Kent, Robert Restieaux.....1855
Kirchgasser, William Charles.....1888
Lampa, Robert Raymond.....1892
Lascoff, Jacob Leon.....1903
Lovis, Henry Christian.....1892
MAIN, THOMAS FRANCIS.....1872
Mariamson, Max.....1902
Mayo, Caswell Armstrong.....1893
McIntyre, Ewen.....1873
McIntyre, Ewen, Jr.....1903
McKesson, George Clinton.....1888
MCKESSON, JOHN, JR.....1867
Molwitz, Ernest.....1867
Murray, Benjamin Lindley.....1896
Niece, Frederic Ellwood.....1903
O'Neil, Henry Maurice.....1879
Pennock, Edward.....1898
Plaut, Albert.....1894
Quackinbush, Benjamin Franklin.....1886
RAMSPERGER, GUSTAVUS.....1860
Robinson, William Josephus Marir...1902
RUNYON, EDWARD WHEELOCK.....1875
Rusby, Henry Hurd.....1890
Salem, Louis Napoleon.....1905
Sawyer, Edward Sands.....1904
Schenck, Henry.....1903
Schieffelin, William J.....1892
Schimpf, Henry William.....1894
Schleussner, Charles Frederick.....1902
Schmid, Henry.....1887
Schnackenberg, Karl.....1904
SEABURY, GEORGE JOHN.....1876
Sheridan, William Franklin.....1904
SKELLY, JAMES JOSEPH.....1866
Stearns, William Lincoln.....1903
Stephenson, John Joseph.....1905
Swann, Samuel Van Buren.....1903
Takamine, Jokichi.....1898
Weicker, Theodore.....1905
Weinstein, Abraham.....1904
Weinstein, Joseph.....1905
White, Charles Hugh.....1902
Wichelns, Frederick.....1881
Wickham, William Hull.....1870
Wolff, Gustave.....1903

Oswego.

Butler, Charles Henry.....1887

Plattsburg.

Hitchcock, John E.....1892

Port Richmond.

Kerr, Frederick William.....1905

Richfield Springs.

Smith, Willard Alfred.....1880

Saratoga Springs

FISH, CHARLES FREDERICK.....1866

Stapleton, Staten Island.

Becker, Ulrich William.....1904
Roehrig, Albert Michael.....1902
Rogers, Edward.....1902

Syracuse.

Dawson, Edward Seymour, Jr.....1876
Muench, William.....1899
Snow, Charles Wesley.....1876

Utica.

Blaikie, William.....1879
Watson, William, Jr.....1902

Wellsville, Allegany Co.

Hall, Edwin Bradford.....1879

Yonkers.

Petsche, Franz Fried. Bismarck Wilhelm. 1892

NORTH CAROLINA.

Asheville.

Pfafflin, Henry Adolph.....1892
Smith, Whitefoord Gamewell.....1892

Chapel Hill.

Howell, Edward Vernon.....1900

China Grove.

Swaringen, DeWitt Clinton 1905

Durham, Orange Co.

Vaughan, Parry Wyche.....1882

Fayetteville.

Horne, Warren Winslow 1902

Morganton.

Leslie, William Augustus 1902

New Bern.

Bradham, Caleb Davis.....1902

Rowland.

Ward, Homer Benjamin.....1901

Scotland Neck.

Whitehead, Eugene Thomas 1900

Smithfield.

Hood, William Dameron 1905

Snow Hill.

Walker, Emmett Edward 1900

Tarboro.

Macnair, Whitmel Horne.....1898
Zoeller, Edward Victor.....1878

Wilmington.

Hardin, John Haywood 1881

NORTH DAKOTA.

Devil's Lake.

Hodgkinson, Albert Edgar.....1903

Erdmore.

Simenstad, Martin O. 1903

Jamestown.

White, Herbert Eugene 1897

Kathryn.

Simmons, Gustav Tobias.....1903

Willow City.

Baillie, Frederick Daniel.....1904

OHIO.

Akron.

Collins, Frank Askew 1904
Dutt, William.....1905
Harper, Charles Bennett.....1904
Lemasters, William Otterbein 1905

Barnesville.

Ely, Ernest Sykes.....1904

Cambridge.

Ogier, John Morrison 1895

Canton.

Jones, Ernest 1905
Roth, Charles Robert 1900
Schlaboch, Edward John.....1904

Chardon.

Gape, Arthur Garfield 1904

Chillicothe.

Howson, Arthur Bayshawe.....1886

Cincinnati.

Brand, Joseph Henry 1904
Burdsal, Albert Howard 1904
DeLang, Alfred 1887
Fennel, Charles Theodore Piderit 1886
Fieber, Gustavus Adolphus.....1893
Freericks, Frank Herman.....1905
French, Rolland Hall 1903
Gansz, William Henry.....1905
Gordon, William John Maclester....1854
Greyer, Julius 1880
Katz, Otto.....1904
Kutchbauch, John Frederick 1904
Lloyd, John Uri 1870
Lutterman, Louis August 1904
Merrell, Charles George 1888
Merrell, George 1879
Ruppert, John 1880
Serodino, Herman 1880
Voss, Edward, Jr.....1904
Wetterstroem, Albert Frederick Charles. 1888

Wetterstroem, Theodore David 1897
YORSTON, MATTHEW MACKAY.....1864
Zorn, Emil.....1904
Zuenkeler, John Ferdinand.....1887
Zwick, Albert Otto 1904

Circleville.

Fickardt, Frederick Lutz 1904

Cleveland.

Arny, Harry Vin 1891
Bauer, Jonathan Melanchthon.....1903
Bechberger, Henry 1904
Beckenbach, Edward.....1904
Benfield, Charles William.....1893
Brown, Charles Malvern.....1902
Cobb, Ralph Lathrop 1883
Drach, George Louis.....1902
Drake, Wallace Clinton 1902
English, George Elbert 1903
Feil, Joseph 1885
Firth, Samuel Sol. 1903
Fischer, Henry John.....1902
Fox, Willard Milton 1903
Gausby, Robert Arthur 1904
Gehrung, John Michael 1905
Haake, William Henry 1893
Hankey, William Tabor 1902
Hannan, Owen Burdette.....1893
Hechler, Edward Henry.....1904
Herold, Lodimir 1903
Hopp, Lewis Christopher.....1876
Kuder, William Frank 1893
Lehr, Philip 1885
McDonald, Walter David.....1905
Miller, Frederick John 1902
Mitermiler, John Alfred 1903
Muhlhan, Otto Emil 1905
Neuberger, Joseph Anton.....1904
Oertel, Alfred Augustus 1903
Placak, Harry.....1902
Schoenhut, Christian Henry.....1888
Selzer, Eugene Reinhold.....1893
Sherwood, Henry Jackson 1894
Sieplin, Charles Augustus.....1904
Sords, Thomas Vincent.....1893
Southard, Frank Allan.....1903
Stern, August Otto 1904
Tielke, Maxwell Gustave.....1904
Voss, George William 1885

Columbiana.

Ink, Charles Eliott.....1885

Columbus.

Dye, Clair Albert.....1901
Haney, Thomas Carlyle 1903
Hatton, Edgar Melville 1878
Hatton, Ellmore Wright.....1894
Kaemmerer, William Frederick.....1899
Kauffman, George Beecher.....1882
Matson, George Hiram, Jr. 1869
Ogier, William Robert 1901
Rauschkolb, John 1894
Sauerbrun, Otto Orville.....1905
Schueller, Frederick William.....1880
Webb, Edward Nathan.....1905
Wendt, William Carl.....1901

Conneaut, Ashtabula Co.

Dexter, Thomas Harold 1905
Symonds, Arthur Henry.....1892

Dayton.

Burkhardt, Mark Anthony 1887
Nipgen, Frank M. 1904
Stierle, John G.....1904

Delphos.

Ford, Myron Nile 1905

Demos.

Mayhew, Earle William 1905

Dennison.

Lanning, Adrian Roy 1904

Dresden.

Nicholson, Ralph Burt 1905

East Liverpool.

Holloway, Jesse Daniel.....1905

Grand Rapids, Wood Co.

Thurston, Azor.....1886

Hamilton.

Howe, John William.....1904

Hillsboro.

Garrett, Oscar Newton 1902

Holloway.

Murphy, Charles Corliss 1904

Hopedale.

Stringer, Orum Hines 1905

Lisbon.

Crook, Frank Richards.....1905

Logan.

Harrington, Frank.....1869

Magnolia.

McIlravy, Maude Jeanette 1903

Martinsburg.

Breece, Charles Amos 1905

Mingo Junction.

Bryson, William Smith.....1905

Navarre.

GROSSKLAUSS, JOHN FERDINAND.....1859

Painesville.

Austin, William Carey.....1904

Pomeroy.

Roush, Frederick Alman.....1905

Scio.

Beal, James Hartley 1892
Creighton, Mary Louisa 1903

Sherrodsville.

Allen, Andrew Campbell.....1905

Springfield.

CASPER, THOMAS JEFFERSON 1867
Siegenthaler, Harvey Newton 1882

Toledo.

Bowman, Waldo Moffett.....1905
Huston, Thomas Benton.....1904
Ludwig, William Edward 1904

Upper Sandusky.

Von Stein, John Henry 1904

Washington.

Warfield, James Allen.... 1905

Wooster.

OHLIGER, LOUIS PHILIP 1871

Youngstown.

Cassaday, Orlin Ulysses 1899

OKLAHOMA TERRITORY.

Carnegie.

Whittet, James.....1905

Guthrie.

Lillie, Foress Ball 1900

Hennesey.

Dinkler, Frank A. 1900

Medford.

Neal, Thomas Lindsey 1904

Norman.

Seymour, James 1903
Washburn, Homer Charles.....1905

Shawnee.

Remington, John Marvin 1904

Stroud.

Burton, John Clement.....1902

Yukon.

Jeffers, Clyde Norman.....1903
Settle, James Albert.....1903

OREGON.

Ashland, Jackson Co.

McNair, John Sydenham.....1902

Marshfield.

Brown, James Lee. 1903

Oregon City.

Huntley, Clyde Gibson 1904

Portland.

Blumauer, Louis.....1889
Laue, John Max Alfred.....1904

The Dalles.

Blakeley, George Clarence 1892

PENNSYLVANIA.

Allegheny City.

Einstein, Morris.....1900
Gleghorn, James Seymour 1900
Malloy, William Bernard 1905
Smith Joseph Homer.....1905

Beaver, Beaver Co.

Andriessen, Hugo 1875

Brownsville.

Risbeck, John Matthew 1905

Butler.

Boyd, Charles Newton 1900

Carlisle.

Horn, Wilbur Fisk 1876

Columbia.

Zeamer, Harry Wisler 1905

Connellsville.

Berryhill, Henry Pennick. 1890
Hetzel, Chauncey Roy 1905
Hetzel, Phillip Wilhelm..... 1905

Corsica.

Scott, Henry Rayburn..... 1905

Crafton.

Holsopple, J. Bert. 1905
McAteer, James William..... 1905

Du Bois.

Hay, Charles La Mar 1898

Easton.

Anspach, Paul Bucher..... 1903
Semple, Henry Beddleman, Jr. 1903

Edinburg.

Burke, Madge Adaline 1905

Edwardsdale.

Lohmann, John 1904

Franklin.

McGarr, Cuvier Lee..... 1905

Harrisburg.

GEORGE, CHARLES THEODORE 1873
Gorgas, George Albert..... 1884
Gross, Edward Ziegler..... 1883
Miller, Jacob Augustus 1873
Smith, Benjamin Franklin 1892

Haverford.

Harbaugh, Wilson Linn..... 1896

Johnstown.

Griffith, Charles 1900
Griffith, James Arthur 1905

Lancaster.

Frailey, William Otterbein..... 1903
Heinitsh, Sigmund William 1889
Martin, David G..... 1905

Langhorne.

HANCOCK, CHARLES WEST..... 1868

Lebanon.

LEMBERGER, JOSEPH LYON..... 1858
Redsecker, Jacob Henry..... 1881

Manheim, Lancaster Co.

Ruhl, Harry Fry. 1902

Mars.

Willets, Charles Ellsworth..... 1905

McKeesport.

West, Walter Lionel 1905

Media.

Meeker, George Herbert..... 1905

Mt. Joy, Lancaster Co.

Garber, Elmer Franklin Weaver 1901

Mount Pleasant.

Cummings, John A..... 1905

Mt. Union.

Harper, Grace Irene 1905

New Castle.

Haley, John B..... 1902
Wallace, John Crawford..... 1905

Norristown.

Reed, Willoughby Henry 1893

Philadelphia.

Apple, Franklin Muhlenberg 1905
Baer, Jacob Michael 1902
BAUER, LOUIS GUSTAVUS 1867
Bell, Robert Nevens..... 1905
Billetdoux, Chester Augustus 1903
Borell, Henry Augustus. 1874
BORING, EDWARD MCCURDY 1867
Burg, John Dellinger..... 1888
Busch, Miers..... 1903
Campbell, Milton..... 1902
Campbell, Theodore..... 1902
Cliffe, William Lincoln 1898
Cook, Ernest Fullerton..... 1901
Crawford, Joseph 1903
Donnel, Cornelius Philip..... 1902
Egbert, Seneca..... 1905
Ellis, Evan Tyson 1857
England, Joseph Winters 1893
Eppstein, Jacob 1902
Evans, George Bryan 1902
Feidt, George David 1898
Fox, Peter Paul..... 1869
French, Harry Banks..... 1890
Gano, William Hubbell..... 1892
Graham, Willard 1902
Hance, Anthony Miskey..... 1902

HANCE, EDWARD HANCE 1857
Harbold, John Tilden 1905
Hassinger, Samuel Ellphat Reed 1880
Haussmann, Frederick William 1895
Haydock, Susannah Garrigues 1905
Heim, William Joseph 1902
Heintzelman, Joseph Augustus 1858
Hoch, Aquilla 1896
Hughes, Francis Stacker 1902
Kahn, Solomon Karl 1905
Kelley, John J. 1905
Kline, Clarence Mahlon 1902
Kline, Mahlon Norwood 1878
Koch, Louis 1872
KRAEMER, HENRY 1892
Krewson, William Egbert 1875
LaWall, Charles Herbert 1896
Lee, William Estell 1905
Leedom, Charles 1902
Lowe, Clement Belton 1895
Matusow, Harry 1897
McIntyre, William 1868
Mellor, Alfred 1864
Mentzer, Harvey H. 1902
MILLER, ADOLPHUS WILLIAM 1868
MILLIGAN, DECATUR 1867
Minehart, John Roy 1905
Moerk, Frank Xavier 1898
Monaghan, Thomas Francis 1902
MOORE, JOACHIM BRICKLEY 1860
MORRIS, LEMUEL IORWERTH 1880
Mulford, Henry Kendall 1896
Oetinger, Albert 1902
Osterlund, Otto William 1902
Ottinger, James Jeremiah 1876
Peacock, Bertha Leon (Mrs.) 1895
Peacock, Josiah Comegys 1892
Pile, Gustavus 1881
Potts, David Gardner 1893
REMINGTON, JOSEPH PRICE 1867
Renshaw, Millicent Saxon 1905
Rosengarten, George David 1902
Russell, Hamilton 1905
Sadtler, Samuel Philip 1893
Shafer, Erwin Clement 1893
SHINN, JAMES THORNTON 1860
Shoemaker, Clayton French 1902
SHOEMAKER, RICHARD MARTIN 1865
Smith, Albert Henry 1902
Smith, Walter Valentine 1902
Sprissler, Clara 1902
Stroup, Freeman Preston 1900
Swain, Harry 1902
Thompson, William Beatty 1858
Thum, John Karl 1905
Vanderkleed, Charles Edwin 1902
Warner, William Richard, Jr. 1902
Weidemann, Charles Alexander 1868
Weidemann, George Buzby 1902
Wendel, Henry Edward 1873
Wiegand, Thomas Snowden 1857
Wilbert, Martin Inventius 1902
Wolcott, Abraham Lincoln 1903
Woodland, Edward Elias 1905

Pittsburg.

Aron, Frank X. 1905
Blank, Herman Gustave 1905
Blumenschein, Frederick John 1904
Dahlin, Horace Otto 1905
Darbaker, Lessure Kline 1905
Emanuel, Louis 1878
Engelsberg, Paul. 1905
Fawcett, Charles Emerson 1905
Judd, Albert Floyd 1901
Koch, Julius Arnold 1892
Muchnic, Adolph Morris 1905
Ringer, Charles Elmer 1905
Rodemoyer, William Edward 1901
Schaeffer, Emil August 1900
Siegfried, Henry J. 1905
Smythe, William Raymond 1905
Thompson, John Reynolds 1905
Trust, Edward 1905
Voellger, Ernest Hugo 1905
Walter, Peter G. 1905
Wiegel, Carl George 1904

Plumville.

Green, James Blaine 1905

Pottsville.

Diebert, Thomas Irwin 1882

Rankin.

Hollander, Joseph Maurice 1905

Reading.

Stein, Jacob Henry 1902
ZIEGLER, PHILIP MILTON 1867

Robesonia.

Moyer, Lewis Nathan 1903

Rochester.

Patterson, Charles Meade 1905

Scranton.

Davis, Emma May 1905
Davis, George Warren 1905
Doersam, Philip, Jr. 1903
Thomas, Daniel Judson 1905

Shenandoah.

Houck, Paul Winters 1905

Swissvale.

Johnson, Ralph Henry 1901

Towanda.

PORTER, HENRY CARROLL 1872

Uniontown.

Clark, Harry Scott 1905
Claybaugh, Springer 1904

Washington.

Vowell, Louis Sweitzer 1905

Waynesburg.

Hill, Frank Rush 1905

Wilkesbarre.

Nagle, Frederick Stanley 1904

Wilkinsburg.

Hall, Guy P. 1905

Williamsport.

Cornell, Edward Augustus 1873
Millener, William S. 1905
Smith, Edward W. 1902
Walton, Lucius Leedom 1904

Wilmerding.

Young, Harry Garfield 1905

York.

Boyd, Guy Stephen 1903
Leber, Jacob Gilbert 1905
Patton, John Franklin 1880
Smith, Jacob Schall 1903

PHILIPPINE ISLANDS.

ISLAND OF JOLO.

Jolo.

Askew, Alfred Joseph 1905

ISLAND OF LUZON.

Manila.

Albert, Alejandro 1904
Comfort, Newton C. 1904
Guerrero, Leon Maria 1904
McBride, Charles Robert 1904

RHODE ISLAND.

Narragansett Pier.

Tobin, John Martin 1887

Newport.

Bristow, Thomas George 1904
Downing, Benjamin Franklin, Jr. 1886
Pearson, Joseph Frederick 1897
Wood, John William 1897

Providence.

Blanding, William Oliver 1894
Cone, John Wright 1876
Crawford, Frank Eugene 1902
Greene, William Ray 1883
Lyon, George Calvin 1899
O'Hare, James 1888
Pearce, Howard Anthony 1894
Strickland, Franklin Nelson 1905

Westerly.

Collins, Albert Burlingame 1882
Collins, Mary Elizabeth 1902

Woonsocket.

Jackson, Frank Anthony 1900
Simmons, Frank Birtles 1897

SOUTH CAROLINA.

Charleston.

Speissegger, Walter Louis 1902

Pelzer.

Bramblett, Oscar Eugene 1905

SOUTH DAKOTA.

Burke, Gregory Co.

Fulton, Peter MacMullen 1902

Dell Rapids.

Bent, Edward Clarence 1905

Redfield.

Crain, Z. A. 1904
Packard, Franklin Hiram 1904

Watertown.

Jones, David Franklin 1895

Yankton.

Brecht, Frederick Adolph 1895

TENNESSEE.

Bell Buckle.

Trolinger, Ernest Franklin 1903

Chattanooga.

Voigt, Joseph Frederick 1893

Knoxville.

Rosenthal, David Abraham 1894

Memphis.

ROBINSON, JAMES SCOTT.....1869

Nashville.

McGill, John Thomas 1900
Ruddiman, Edsel Alexander 1894
White, William Rufus.....1904

Sewanee.

Leiper, James Armstrong, Jr.....1904

Sharon.

Shannon, Thomas J.....1905

TEXAS.

Austin.

Neville, William Rust 1901

Brownsville.

Willman, William George. 1904

Dallas.

De Lorenzi, Albert 1890
Eberle, Eugene Gustavus 1896

Decatur.

Hayter, John Brice.....1905

Denton.

Allison, Samuel Porter.....1905

El Paso.

Noaks, Richard Sidney 1905

Forney.

Adams, Frank Milton 1903

Fort Worth.

Whitsitt, Lee Melford.....1905

Galveston.

Buckner, John Clark 1905
Cline, Raoul Réné Danniel.....1898
Orton, Ingomar François 1891

Goldthwaite.

Oxford, Albert 1904

Hallettsville.

Saccar, Michael 1905

Hearne.

Hazlett, James Lupe 1900

Houston.

Burgheim, Jacob 1892
Hoffman, Herman. 1902

Hughes Springs.

Glass, William Finis 1904

Jacksonville.

Johnson, Ambrose 1903

Longview.

Hamilton, Clarence Barnett.....1903
Sims, Henry Upson.....1903

McKinney, Callin Co.

Dulaney, Joseph Field.....1902

San Antonio.

Schmitt, George Joseph Francis.....1890

Stamford.

Cooper, Oscar Hamilton.....1904

Sulphur Springs.

Smith, Ben. E. 1904

Taylor.

Thames, Joseph Jefferson 1895

Terrell.

Schrodt, Jacob 1903

Troupe.

McKay, Felix Early.....1903

Velasco.

Roeller, Edward Frank.....1902

Waelder, Gonzales Co.

Brookes, Virginia Cade. 1901

Whitney.

Miller, Mark Elias. 1905

UTAH.

Salt Lake City.

Irvine, Darwin William.....1902

VERMONT.

Barton.

Pierce, Horace Cooley.....1904

Brandon.

Hopkins, Zerah Blaisdell 1900

Burlington.

Parmalee, Walter Woodruff 1901
Zottman, William Henry 1903

Montpelier.

Blakely, Collins 1899
Slade, Harry Allen. 1899
Terrill, Willis Ethel 1899

St. Albans.

Dutcher, Alfred Luther. 1892

St. Johnsbury.

Bingham, Charles Calvin 1875

VIRGINIA.

Charlotte C. H.

Williams, Walton Gregory 1905

Culpeper.

Goldsborough, Charles Henry..... 1898

Harrisonburg.

Avis, James Little..... 1905

Newport News.

Congdon, George Gardner 1903
Klor, Alexander Edward George. 1899

Norfolk.

May, Edward 1897
McLarty, Colin..... 1898

Richmond.

Baker, Thomas Roberts 1856
Benson, John Meade. 1903
Briggs, Andrew Gessner 1890
Harrison, Robert Lucius..... 1900
Miller, Turner Ashby..... 1894
Reade, Frank Marshall..... 1900
Scott, William Henry 1873

Suffolk.

Hall, Joseph Patten..... 1900

WASHINGTON.

La Conner, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

Port Townsend.

Allen, Grafton C..... 1902
Achenbach, John..... 1904
Troxler, Robert Fulton 1902

Pullman.

Watt, George Henry..... 1896

Puyallup.

Scott, Walter Robert 1904
Truedson, Eric Per..... 1904

Seattle.

Aschermann, Gustav Singer 1905
Holmes, Henry Elliott..... 1880
Johnson, Charles Willis..... 1903
Lough, Thomas Warner 1905
Osseward, Cornelius 1897
Watson, Joseph Ryerson..... 1904

Snohomish.

Wilbur, Lot 1896

Spokane.

Bradley, Linn 1904
McArthur, James W. 1904

Tacoma.

Gamer, Albert Charles C. 1902
Walker, Charles Henry..... 1904

Walla Walla.

Tallman, Lewis Lifferty..... 1904

Wilbur.

Bandy, George 1905

WEST VIRGINIA.

Cameron.

Hill, William Gipson Clark 1905

Colliers.

Robinson, Henry Sherman..... 1905

Fairmount.

Moran, William Patrick 1905

Littleton.

Carney, Frank..... 1905

Moundsville.

Gray, Will Wesley 1905

New Martinsville.

Keyser, George Francis 1905

Philippi.

Mason, Wm. Lindsey..... 1905

Sutton.

Walker, Alfred..... 1905

Wellsburg.

Buchanan, Clark Gambrill 1903

Wheeling.

Coleman, John 1905
Gordon, William C.....1905

WISCONSIN.

Eau Claire.

Boberg, Otto Johan Sinius 1903

La Crosse.

Beyschlag, Charles 1880

Madison.

Brandel, Irvin Walter.....1903
Fischer, Richard 1901
Kremers, Edward.....1887
Rabak, Frank 1905

Mayville, Dodge Co.

Sauerhering, Edward.....1903

Milwaukee.

Dadd, Robert Morrow.....1896
DRAKE, JOHN RANSOM.....1860
Janssen, Jacob Solomon 1903
Kettler, Edward, Jr.....1896
Krembs, Ernest Maximilian 1903
Mieding, Albert Edward.....1903
Raeuber, Edward Gottfried.....1900
Ruenzel, Henry Gottlieb.....1892
Schrank, Charles Henry 1876
Spiegel, Adolph 1905

Neillsville.

Sniteman, Charles Clarence 1881

Oconomowoc.

Peters, Henry August 1903

Racine.

Horlick, Alexander James 1904

Watertown.

Eberle, Herman Theodore 1901

DOMINION OF CANADA.

MANITOBA.

Stonewall.

Leonard, Alexander Robert 1904

Winnepeg.

Bletcher, Henry Ernest John 1904

NEW BRUNSWICK.

St. John.

Paddock, Morris Venner.....1902

NOVA SCOTIA.

Halifax.

Simson, Francis Cook 1876

ONTARIO.

Guelph.

Stewart, Alexander 1905

Hamilton.

Clark, John Alexander.....1890

Harrow.

Darby, Edmund Feilde 1903

Ottawa.

SAUNDERS, WILLIAM 1860

Sarnia.

Geary, Richard Thomas 1904

Stratford.

WAUGH, GEORGE JAMES 1862

Toronto.

Hargreaves, John.....1904
Heebner, Charles Frederick.....1894

Windsor.

D'Avignon, John Eugene.....1888

QUEBEC.

Montreal.

Lachance, Seraphin.....1888
Morrison, Joseph Edward.....1888

Quebec.

Willis, Henry.....1897

St. Hyacinthe.

St. Jacques, Gaston 1900

Three Rivers.

Williams, Richard Wellington.....1883

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Halloway, Robert Railton, Carlisle, England 1905
Heyl, James Bell, Hamilton, Bermuda 1863
Martin, Nicholas Henry, Gateshead-on-Tyne, England 1891
Miller, Emerson Romeo, Santiago de la Vegas, Cuba 1895
Murray, Alexander, San José de Costa Rica 1903
Patch, James Alfred, Beirût, Syria 1903
Pirie, Alfred Mitchell, Cartago, Costa Rica 1903
POWER, FREDERICK BELDING, London, England 1872
WELLCOME, HENRY SOLOMON, London, England 1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Daly, James Edward 1902

NOTE.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings, 1900, p. 18.)

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

Attfield, Dr. John, F. R. S., Watford, England.
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Ince, Joseph, F. L. S., Glenholme, 13 Alfred Road, Acton, W., London, England.
Martenson, Staatsrath J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
Schaer, Dr. Edward, Professor of Pharmacy, Pharmaceutisches Institut der Universität, Strassburg, Germany.
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

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Adams, Frank M.,
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Adams, Jas. O.,
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132 Calle Ronquillo,Santa Cruz,Manilla,P.I.
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U. S. Naval Museum, Washington, D. C.
Alexander, John M.,
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Allen, Earl,
Unionville, Ia.
Allen, E. Floyd,
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Aquaro, Joseph,
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Asher, Philip,
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Avery, Charles H.,
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Bailey, Leon,
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Baker, Edwin,
Bridge st., Shelburne Falls, Mass.
Baker, T. Roberts,
cor. Lester & Ash sts., Richmond, Va.
Balkcom, Victor F.,
26 Monroe st., Tallahassee, Fla.
Ball, Charles E.,
227 High st., Holyoke, Mass.
Ballagh, Wilfred T.,
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BALLARD, JOHN W.,
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Balser, Gustavus,
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Wilbur, Wash.
Bange, Otto F.,
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Bard, William E.,
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Barnett, Joel J.,
Care of Sharp & Dohme, Baltimore, Md.
Barrett, Chas. L.,
601 Berkley st., Camden, N. J.
Barry, Aug. F.,
Holly Springs, Miss.
Bartells, George C.,
130 East State st., Camp Point, Ill.
Barth, Geo. F.,
State st., North Alton, Ill.
Bartlett, N. Gray,
22d st. & Indiana ave., Chicago, Ill.
Bartley, Elias H.,
65 S. Portland ave., Brooklyn, N. Y.
Bartmer, Adolph H.,
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Base, Daniel,
329 N. Schroeder st., Baltimore, Md.
BASSETT, CHARLES H.,
109 Arch st., Boston, Mass.
Bastian, Otto C.,
129 W. Washington st., South Bend, Ind.
Battle, Orrin McR.,
Hope, Ark.
Bauer, Jonathan M.,
Payne ave. & Huntington st., Cleveland, O.
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Beal, James H.,
Scio, O.
Bear, Pierce B.,
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Bechberger, Henry,
535 Kinsman st., Cleveland, O.
Beck, Julius E.,
Fort Stanton, New Mex.
Beckenbach, Ed.,
223 Superior st., Cleveland, O.
Becker, Charles L.,
304 Main st., Ottawa, Kan.
Becker, Irwin A.,
Care of Michael Reese Hosp., Chicago, Ill.
Becker, Ulrich W.,
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Behrens, Emil C. L.,
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Bell, S. Howard,
West Derry, N. H.
Benfield, Charles W.,
Wilson & Payne aves., Cleveland, O.
Benson, John M.,
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Bent, Edward C.,
Dell Rapids, S. Dak.
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Beringer, George M., Jr.,
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Bernstein, Michel,
Texas ave. & Murphy st., Shreveport, La.
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Main st., Cynthiana, Ky.
Berryhill, Henry P.,
Buttermore Block, Connellsville, Pa.
Best, John,
1 German Block, Central City, Colo.
Bethea, Oscar W.,
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593 Orange st., Newark, N. J.
Beukema, James A.,
129–131 Monroe st., Grand Rapids, Mich.
Beyschlag, Charles,
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Bingham, Charles C.,
37 Main st., St. Johnsbury, Vt.
Birdsong, Lafayette F.,
Woodville, Miss.

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Blahnik, Marie (Mrs.),
88 W. 18th st., Chicago, Ill.
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202 Genesee st., Utica, N. Y.
Blake, James E.,
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Blakeley, George C.,
175 2d st., The Dalles, Ore.
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5 State st., Montpelier, Vt.
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Boehm, Solomon,
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113 Washington st., Iowa City, Ia.
Boesewetter, Richard,
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802 Harrison st., Mt. Vernon, Ill.
Bond, John B.,
Main & 5th sts., Little Rock, Ark.
Bongartz, Ferdinand A.,
353 Palisade ave., Jersey City Heights, N. J.

Bonnette, J. Valarus,
Patterson & Ridge sts., Pollock, La.
Boon, Peyton T.,
care of Havre Drug Co., Havre, Montana.
Borell, Henry A.,
2043 Chestnut st., Philadelphia, Pa.
BORING, EDWIN M.,
N. E. cor. 10th & Fairmount ave., Phila., Pa.
Boulton, Emison A.,
8 Market st., San Francisco, Cal.
Boutte, Armand V.,
319 Main st., New Iberia, La.
Bowman, Waldo M.,
102 Bancroft st. E., Toledo, O.
Boyd, Charles N.,
Main st., Butler, Pa.
Boyd, George W.,
121 Second st. N. E., Washington, D. C.
Boyd, Guy S.,
405 S. George st., York, Pa.
Boyken, John W.,
250 Sutter st., San Francisco, Cal.
Boynton, Herschell,
74 Main st., Biddeford, Me.
Boyson, John H.,
998 Valencia st., San Francisco, Cal.
Brack, Charles E.,
Ensor & Forrest sts., Baltimore, Md.
Bradbury, Wymond H.,
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Pollock & Middle sts., New Bern, N. C.
Bradley, Linn,
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Brandenberger, Adolph,
130 E. High st., Jefferson City, Mo.
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Breece, Charles A.,
Martinsburg, O.
Breslin, Michael T.,
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Breunert, August,
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Brewer, Howard D.,
19 Oxford st., Worcester, Mass.
Brewer, Justin S.,
518 Hudson st., Hoboken, N. J.
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Brisley, Harry,
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Marshfield, Ore.
Brown, John O.,
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Bryson, William S.,
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Buckner, John C.,
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Burg, John D.,
4th & Brown sts., Philadelphia, Pa.

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Burke, Madge A. (Miss),
Edinburg, Pa.
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Burkhardt, Mark A.,
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Burnham, Alfred A., Jr.,
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Burrough, Horace, Jr.,
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Collins, Mary E. (Miss),
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Conzet, Rufus W.,
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Cook, E. Fullerton,
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Cook, Thomas P.,
114 William st., New York, N. Y.
Cookson, Joseph W.,
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Coonley, Charles,
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Cross, Elias H.,
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Crossman George A.,
Raynham, Mass.
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Davies, Llewellyn P.,
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Davis, Charles L.,
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Davis, Eugene M.,
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Dissosway, Thurston N.,
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Eberle Herman T.,
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EBERT, ALBERT E.,
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Eccles, Robert G.,
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Gale, William H.,
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1880 Lexington ave., New York, N. Y.
Sterett, Walter B.,
Care Cooper Drug Company, Joplin, Mo.
Stern, August O.,
2457 Superior st., Cleveland, O.
Stevens, Alviso B.,
536 Thompson st., Ann Arbor, Mich.
Stevens, Edward,
901 Pennsylvania ave., Washington, D. C.
Stevens, Frederick S.,
Auburn, Cal.
Stewart, Alexander,
61 Wyndham st., Guelph, Ont., Can.
Stewart, Francis E.,
17 Prospect st., East Orange, N. J.
Stewart, Harry E.,
639 W. Bay st., Jacksonville, Fla.
Stier, Carl,
Marine Hospital, Key West, Fla.
Stierle, J. C.,
5th & Jefferson sts., Dayton, O.
Stimson, Charlotte E. (Miss),
3410 Rhodes ave., Chicago, Ill.
Stockton, Robert C.,
Main & 2d sts., Richmond, Ky.
Stoddart, Thomas,
84 Seneca st., Buffalo, N. Y.

Stolle, Henry J.,
4th & Market sts., St. Louis, Mo.
Stolz, Otto G.,
60 Rush st., Chicago, Ill.
Stone, Clarence G.,
273 Rich ave., Mt. Vernon, N. Y.
Stott, Samuel T.,
505 Penna. ave. N. W., Washington, D. C.
Stoughton, Dwight G.,
204 State st., Hartford, Conn.
Stowe, Ernest A.,
100 N. Prospect st., Grand Rapids, Mich.
Stowell, Daniel,
1045 Washington st., Boston, Mass.
Strickland, Franklin N.,
4 Market Square, Providence, R. I.
Stringer, Orum H.,
Hopedale, O.
Stroup, Freeman P.,
145 N. 10th st., Philadelphia, Pa.
Stuart, Wm. A.,
800 W. Baltimore st., Baltimore, Md.
Sturmer, Julius W.,
323 Salisbury st., Lafayette, Ind.
Stutzlen, Frank C.,
231 3d st., Elizabeth, N. J.
Sultan, Frederick W.,
4521 Forest Park Boulevard, St. Louis, Mo.
Sum, Francis,
2840 Clark ave., St. Louis, Mo.
Suppan, Leo R. A.,
2648 Russell ave., St. Louis, Mo.
Swain, Harry,
13th & Lombard sts., Philadelphia, Pa.
Swann, Samuel V. B.,
918 6th ave., New York, N. Y.
Swaringen, DeWitt C.,
China Grove, N. C.
Sweet, Caldwell,
22 W. Market Square, Bangor, Me.
Sweet, William H.,
1731 Chicago ave., Minneapolis, Minn.
Symonds, Arthur H.,
Conneaut, Ashtabula Co., O.
Takamine, Jokichi,
613 W. 142d st., New York, N. Y.
Tallman, Lewis L.,
2d & Main sts., Walla Walla, Wash.
Taylor, Augustus C.,
201 Maryland ave. N. E., Washington, D. C.
Taylor, George E.,
Pueblo, Colo.
Teeters, Wilbur J.,
Iowa Coll. Pharm., Iowa City, Ia.
Temm, William D.,
1926 N. Grand ave., St. Louis, Mo.
Terrill, Willis E.,
9 State st., Montpelier, Vt.
Thames, Joseph J.,
E. Main st., Taylor, Williamson Co., Tex.
Thelander, Creston C.,
925 4th st., Sioux City, Ia.
Thomas, Daniel J.,
345 Wyoming ave., Scranton, Pa.
Thomas, Robert, Jr.,
108 Broad st., Thomasville, Ga.
Thomasson, Anders,
277 Central st., Lowell, Mass.
Thompson, Albert D.,
1st ave. S. and 3d st., Minneapolis, Minn.
Thompson, Edwin T.,
911 W. 7th st., Sioux City, Ia.
Thompson, John R.,
315 Smithfield st., Pittsburg, Pa.
Thompson, Joseph,
401 W. 7th st., Sioux City, Ia.
Thompson, William B.,
4804 Trinity Place, W. Philadelphia, Pa.
Thorburn, Albert D.,
1249 Grace st., Chicago, Ill.
Thorn, Henry P.,
Main st., Medford, N. J.
Thum, John K.,
1531 N. Opal st., Philadelphia, Pa.
Thurston, Azor,
Grand Rapids, Wood Co., O.
Thurston, Edwin J.,
Gulf Quarantine, via Biloxi, Miss.
Tielke, Maxwell G.,
474 Detroit st., Cleveland, O.
Tilden, Amos K.,
7 Bulfinch st., Boston, Mass.
Timberlake, Arthur,
College ave. & 16th st., Indianapolis, Ind.
Timmer, Jacob B.,
181 Lake ave., Grand Rapids, Mich.
Timmons, George D.,
458 Greenwich st., Valparaiso, Ind.
Tobin, John M.,
Narragansett Pier, R. I.
Todd, Albert M.,
204 N. Rose st., Kalamazoo, Mich.
Tontz, George W.,
2248 Dodier st., St. Louis, Mo.

Topping, Arthur E.,
Overbrook, Kan.
Torbert, Willard H.,
756 Main st., Dubuque, Ia.
Toulson, Milbourne A.,
Chestertown, Md.
Traynor, Charles F.,
159 Main st., Biddeford, Me.
Treat, Joseph A.,
Stuart, Guthrie Co., Ia.
Trolinger, Ernest F.,
Bell Buckle, Tenn.
Troxler, Constantine, Jr.,
228 W. Breckenridge st., Louisville, Ky.
Troxler, Robert F.,
Quarantine Sta., Port Townsend, Wash.
Truax, Charles,
42 Wabash ave., Chicago, Ill.
True, Rodney H.,
224 12th st. S. W., Washington, D. C.
Truedson, Eric P.,
Puyallup, Wash.
Trust, Edward,
1221 5th ave., Pittsburg, Pa.
Tucker, Greenleaf R.,
City Hospital, Boston, Mass.
Turnquist, Carl M.,
2458 Wentworth ave., Chicago, Ill.
Tuthill, Frederick P.,
526 Putnam ave., Brooklyn, N. Y.
Uhlich, Ferdinand G.,
2001 Salisbury st., St. Louis, Mo.
Ulch, James J.,
623 E. Scott st., Des Moines, Ia.
Valentine, William G.,
3900 Cottage Grove ave., Chicago, Ill.
Van Antwerp, James C.,
250 State st., Mobile, Ala.
Van Derveer, Robert H.,
Broad & Monmouth sts., Red Bank, N. J.
Van Ness, Geo. I.,
U. S. Marine Hosp., Evansville, Ind.
Van Schaack, Cornelius P.,
138 Lake st., Chicago, Ill.
Van Winkle, Abraham,
35 Clinton ave., Newark, N. J.
Vanderkleed, Charles E.,
5251 Jefferson st., Philadelphia, Pa.
Vargas, Jorge,
809 Beacon st., Boston, Mass.
Varney, Edward F.,
39 Tremont st., Boston, Mass.
Vaughan, Parry W.,
106 E. Main st., Durham, Orange Co., N. C.
Vernor, James,
33 Woodward ave., Detroit, Mich.
Villere, Rene L.,
1001 Esplanade ave., New Orleans, La.
Vincent, Fred. A. C.,
Room 5, Ricksecker Bldg., Kansas City, Mo.
Vitt, Rudolph S.,
3860 S. Broadway st., St. Louis, Mo.
Voegeli, Thomas,
Hennepin & Wash sts., Minneapolis, Minn.
Voellger, Ernest H.,
733 Summerlea st., E. Pittsburg, Pa.
Voigt, Joseph F.,
840 Market st., Chattanooga, Tenn.
VOISS, ARCADIUS,
395 Wells st., Chicago, Ill.
Von Stein, John H.,
Upper Sandusky, O.
VORDICK, AUGUST H.,
Jefferson av. & Benton st., St. Louis, Mo.
Voss, Edward, Jr.,
1201 Vine st., Cincinnati, O.
Voss, Geo. W.,
680 Woodland ave., Cleveland, O.
Votteler, William,
Shelby & Oak sts., Louisville, Ky.
Vowell, Louis S.,
62 S. Main st., Washington, Pa.
Waddell, Minor T.,
1207 Ash st., Indianapolis, Ind.
Wade, Guy L.,
28 South Roane ave., Webb City, Mo.
Walbrach, Arthur,
1200 15th st., Denver, Colo.
Walbridge, Cyrus P.,
620 Washington ave., St. Louis, Mo.
Waldner, Paul J.,
U. S. Naval Laboratory, Brooklyn, N. Y.
Walker, Alfred,
Sutton, W. Va.
Walker, Alfred L.,
424 Woodward ave., Detroit, Mich.
Walker, Chas. H.,
115 South G st., Tacoma, Wash.
Walker, E. Edward,
Snow Hill, N. C.
Wall, Otto A.,
4532 Virginia ave., St. Louis, Mo.
Wall, Otto A., Jr.,
4532 Virginia ave., St. Louis, Mo.

Wallace, John C.,
61 E. Washington st., New Castle, Pa.
Walling, Rufus O.,
Lock Box 322, Keyport, N. J.
Walsdorf, Chas. A.,
Carrollton ave. & Oak st., New Orleans, La.
Walsdorf, Edw. H.,
Peters ave. & Magazine st., New Orleans, La.
Walter, Charles A.,
1824 W. Polk st., Chicago, Ill.
Walter, Peter G.,
cor. Forbes st. & Coltart Sq., Pittsburg, Pa.
Walton, Lucius L.,
50 W. Fourth st., Williamsport, Pa.
Wangler, Conrad D.,
227 E. 4th st., Waterloo, Ia.
Wanous, Josie A. (Miss),
521 Nicollet ave., Minneapolis, Minn.
Ward, A. Jae,
107E.Pike's Peak ave.,ColoradoSpr'gs,Colo.
Ward, Charles A.,
P. O. Box 460, Stoneham, Mass.
Ward, Chas. E.,
790 Broadway, Denver, Colo.
Ward, Enoch J.,
Front st., Ellisville, Miss.
Ward, Homer B.,
Rowland, N. C.
Ware, Charles H.,
1930 Madison ave., Baltimore, Md.
Warfield, James A.,
Washington, O.
Warn, William E.,
Lock Box 342, Keyport, N. J.
Warner, Francis D.,
137 E. Michigan st., New Carlisle, Ind.
Warner, William R., Jr.,
639 N. Broad st., Philadelphia, Pa.
Washburn, Homer C.,
Norman, Okla. Ter.
Watson, Herbert K.,
803 Market st., Wilmington, Del.
Watson, Joseph R.,
1641 20th ave., Seattle, Wash.
Watson, Sidney P.,
137 Richardson st., Atlanta, Ga.
Watson, William, Jr.,
202 Genesee st., Utica, N. Y.
Watt, George H.,
Pullman, Wash.
WAUGH, GEORGE J.,
Ontario st., Stratford, Ont., Can.
Webb, Edward N.,
63 E. Long st., Columbus, O.
Webber, Arthur H.,
Cadillac, Mich.
Webber, J. Le Roy,
277 Greene ave., Brooklyn, N. Y.
Weber, Peter J.,
320 S. 7th st., St. Louis, Mo.
Weed, Nelson,
411 S. Front st., Mankato, Minn.
Weicker, Theodore,
78–80 Beekman st., New York, N. Y.
WEIDEMANN, CHARLES A.,
2148 Green st., Philadelphia, Pa.
Weidemann, George B.,
2148 Green st., Philadelphia, Pa.
Weilbaecher, Frank E.,
6056 Hurst st., New Orleans, La.
Weinstein, Abraham,
401 E. 57th st., New York, N. Y.
Weinstein, Joseph,
75 East Broadway, New York, N. Y.
Weiser, Wm. A.,
127 E. Jefferson st., South Bend, Ind.
Weiser, William P.,
501 Market st., Camden, N. J.
Weiss, Conrad H.,
25 Monroe st., Anacostia, D. C.
WELLCOME, HENRY S.,
Snow Hill Buildings, London, E. C., Eng.
Weller, Frank P.,
755 8th st. S. E., Washington, D. C.
Wells, Edwin H.,
172 Milk st., Boston, Mass.
Wendel, H. Edward,
3d & George sts., Philadelphia, Pa.
Wendt, William C.,
366 S. 4th st., Columbus, O.
Wenzell, William T.,
1998 Ocean Blv'd, San Francisco, Cal.
Werner, Rudolf C.,
2592 Atlantic ave., Brooklyn, N. Y.
Wescott, William C.,
Pacific & Delaware aves., Atlantic City, N. J.
Wesner, Henry C.,
Windsor, Henry Co., Mo.
West, Charles A.,
14 Fulton st., Boston, Mass.
West, Courtney H.,
620 N. 4th st., St. Louis, Mo.
West, Walter L.,
709 Walnut st., McKeesport, Pa.

Westcott, James W.,
423 N. Charles st., Baltimore, Md.
Wetterstroem, Albert,
2867 Colerain ave., Cincinnati, O.
Wetterstroem, Theodore D.,
3935 Spring Grove ave., Cincinnati, O.
Wheeler, William D.,
21 Massachusetts ave., Boston, Mass.
WHELPLEY, HENRY M.,
2342 Albion Place, St. Louis, Mo.
Whipple, George H.,
Broad & Fayette sts., Bridgeton, N. J.
Whitcomb, Frederick E.,
Washington & Garrison aves., St. Louis, Mo.
White, Charles H.,
153 E. 51st st., New York, N. Y.
White, Herbert E.,
Jamestown, N. Dak.
White, Howell Cobb,
119–123 Jackson st., Hawkinsville, Ga.
White, Wm. R.,
207 Foster st., Nashville, Tenn.
Whitehead, Eugene T.,
Main st., Scotland Neck, N. C.
WHITFIELD, THOMAS,
240 Wabash ave., Chicago, Ill.
Whitney, David V.,
3722 E. 12th st., Kansas City, Mo.
Whitney, Edgar F.,
Box 199, Warren, Minn.
Whitsitt, Lee M.,
415 Kentucky ave., Fort Worth, Tex.
Whittet, James,
Carnegie, Okla. Ter.
Wichelns, Frederick,
205 Greenwich st., New York, N. Y.
Wickham, William H.,
91 Fulton st., New York, N. Y.
Wicks, Jesse H.,
316 Central ave., Great Falls, Mont.
Wiegand, Thomas S.,
145 N. 10th st., Philadelphia, Pa.
Wiegel, Carl G.,
1806 Carson st., Pittsburg, Pa.
Wikle, Jesse L.,
1010 Noble st., Anniston, Ala.
WILBERT, MARTIN I.,
2811 Diamond st., Philadelphia, Pa.
Wilbur, Lot,
Ave. C & 1st st., Snohomish, Wash.
Wilcox, Levi,
22 Mitchell ave., Waterbury, Conn.
Wiley, Harvey W.,
Dept. of Agriculture, Washington, D. C.
Willard, Rowland,
131 E. Main st., Haddonfield, N. J.
Willenbrink, Chas. A.,
512 Pike st., Covington, Ky.
Willetts, Charles E.,
Grand ave., Mars, Pa.
Williams, George G.,
P. O. Box 3551, Boston, Mass.
Williams, John K.,
391 Main st., Hartford, Conn.
Williams, Richard W.,
Notre Dame st., Three Rivers, Que., Can.
Williams, Seward W.,
8 Brighton ave., East Orange, N. J.
Williams, Walton G.,
Charlotte C. H., Va.
Williamson, Lee,
330 W. Baltimore st., Baltimore, Md.
Willis, Henry,
4 St. John st., Quebec, Can.
Willman, Wm. G.,
Adams st., Brownsville, Tex.
WILSON, BENJAMIN O.,
46 Canal st., Boston, Mass.
Wilson, Elmer L.,
St. Paul, Neb.
WINKELMANN, JOHN H.,
824 N. Carrollton ave., Baltimore, Md.
Winter, Jas. H.,
1397 Valencia st., San Francisco, Cal.
WINTER, JONAS,
202 Prospect st., Hagerstown, Md.
Wirth, Adam,
618 St. Charles st., New Orleans, La.
Wirthman, J. George,
1535 Grand ave., Kansas City, Mo.
Wirthman, Joseph C.,
18th st. & Troost ave., Kansas City, Mo.
Wisdom, Hugh,
426 State st., Chicago, Ill.
Wittich, Matthew H.,
1519 E. Franklin ave., Minneapolis, Minn.
Witting, Frederick F.,
Longmont, Colo.
Wittmer, Joseph W.,
1347 Clay st., Dubuque, Ia.
Wolcott, A. Lincoln,
514 Arch st., Philadelphia, Pa.
Wolcott, Frank E.,
722 W. New York st., Indianapolis, Ind.

Wolf, Henry A.,
2133 S. 3d st., St. Louis, Mo.
Wolf, J. Carlton,
2207 E. Pratt st., Baltimore, Md.
Wolff, Edward H.,
522 Washington ave., St. Louis, Mo.
Wolff, Gustave,
321 10th ave., New York, N. Y.
WOLTERSDORF, LOUIS,
171 Blue Island ave., Chicago, Ill.
Wood, Alonzo F., Jr.,
2 Church st., New Haven, Conn.
Wood, James P.,
2 Church st., New Haven, Conn.
Wood, John W.,
494 Broadway, Newport, R. I.
Woodland, Edward E.,
1033 Mt. Vernon st., Philadelphia, Pa.
Woodman, Walter L.,
St. Augustine, Fla.
Woodruff, Roderick S.,
92 Prospect st., Waterbury, Conn.
Woods, Charles H. A.,
U. S. Marine Hospital, Chicago, Ill.
Woodworth, Charles B.,
254 W. Wayne st., Fort Wayne, Ind.
Woolsey, Jesse F.,
Care of Eli Lilly & Co., Indianapolis, Ind.
Wooten, Thomas V.,
79 Dearborn st., Chicago, Ill.
Wrensch, Henry E., Jr.,
610 Bloomfield ave., Montclair, N. J.
Wright, Charles L.,
Allen & Dougherty sts., Webb City, Mo.
Wuensch, Charles,
494 Springfield ave., Newark, N. J.
Wulling, Frederick J.,
Minn. University, Minneapolis, Minn.
Wunderlich, Edward,
1415 Dryades st., New Orleans, La.
Wurmb, Theodore H.,
1923 Grand ave., St. Louis, Mo.
YORSTON, MATTHEW M.
1063 Central ave., Cincinnati, O.
Young, Harry G.,
346 Marguerite ave., Wilmerding, Pa.
Zabaldano, Alexander,
1124 Stockton st., San Francisco, Cal.
Zeamer, Henry W.,
240 Locust st., Columbia, Pa.
Zelinski, Walter F. von,
438 W. Madison st., Chicago, Ill.
ZIEGLER, PHILIP M.,
526 Penn st., Reading, Pa.
Zinn, Charles E.,
501 Independence ave., Kansas City, Mo.
ZOELLER, EDWARD V.,
Main st., Tarboro, N. C.
Zorn, Emil,
12th & Elm sts., Cincinnati, O.
Zottman, William H.,
1 Church st., Burlington, Vt.
Zuenkeler, J. Fred.,
1902 Vine st., Cincinnati, O.
Zwick, Albert O.,
19 W. 7th st., Cincinnati, O.
Zwick, Karl G.,
1102 Madison ave., Covington, Ky.

LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF THE LAST REPORT.

		Elected.
Barksdale, George E.,	Richmond, Va.,	1900
Batt, Bruno,	St. Louis, Mo.,	1901
Baylis, Lewis F.,	Jamaica, N. Y.,	1880
Beck, Henry M.,	San Francisco, Cal.,	1902
Beck, John G.,	Baltimore, Md.,	1899
Bell, Thomas,	Norwood, O.,	1904
Bolender, Walter I.,	Canton, O.,	1904
Boyden, Edward C.,	Boston, Mass.,	1874
Conover, James A.,	Jacksonville, Fla.,	1903
Dietz, Emil,	Milwaukee, Wis.,	1903
Dohme, C. Louis,	Baltimore, Md.,	1899
Drake, Frederick T.,	Stoneham, Mass.,	1894
Dunn, Minnie (Mrs.),	Iowa City, Ia.,	1904

		Elected.
Evans, Joseph W.,	West Chester, Pa.,	1877
Fletcher, John W.,	Batesville, Ark.,	1894
Greenthal, Julius,	Detroit, Mich.,	1903
Herb, Joseph,	Superior, Wis.,	1903
Jones, Alexander H.,	Philadelphia, Pa.,	1874
Krueger, Owen W.,	Kansas City, Mo.,	1897
Laird, John,	Springdale, Ark.,	1895
Lowd, John C.,	Boston, Mass.,	1871
Mueller, Adolphus,	Highland, Ill.,	1871
Myers, Daniel,	Cleveland, O.,	1882
Ortiz, Miguel A.,	Havana, Cuba,	1902
Pfefferle, Eugene A.,	New Ulm, Minn.,	1904
Preston, Andrew P.,	Portsmouth, N. H.,	1881
Punch, William F.,	Mobile, Ala.,	1874
Preissler, Henry W.,	Shelbyville, Ky.,	1893
Rains, A. Brown,	Columbia, Tenn.,	1894
Reynolds, Chas. E.,	New York, N. Y.,	1897
Rockefeller, Lucius,	Englewood, N. J.,	1880
Rose, Edward S.,	Vinton, Ia.,	1904
Sailer, Frank,	Philadelphia, Pa.,	1904
Smith, Edward N.,	Thompsonville, Conn.,	1885
Vadbonceur, L. J. Edward,	Montreal, Can.,	1903
Weschckes, Charles,	Springfield, Minn.,	1904
Young, Charles,	Johnstown, Pa.,	1902
Zimmerman, Albert,	Peoria, Ill.,	1893

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF THE LAST REPORT.

		Elected.
Aimar, Chas. P.,	Charleston, S. C.,	1879
Baridon, Louis R.,	Montreal, Can.,	1890
Byrne, John,	Columbus, O.,	1893
Devine, John,	Santa Monica, Cal.,	1887
Dobbins, Edward T.,	Philadelphia, Pa.,	1867
Eichrodt, Chas. W.,	Indianapolis, Ind.,	1892
Graf, Carl A.,	Salina, Kan.,	1901
Hanrath, Frederick R.,	St. Louis, Mo.,	1904
Harbaugh, Duncan J.,	Haverford, Pa.,	1902
Hemm, Louis P.,	Kirkwood, Mo.,	1894
Howard, Fletcher,	Des Moines, Ia.,	1895
Meyer, C. F. G.,	St. Louis, Mo.,	1860
Nattans, Arthur,	Baltimore, Md.,	1885
Parsons, John,	Chicago, Ill.,	1865
Pilson, Abram O.,	Baltimore, Md.,	1898
Rittenhouse, Henry N.,	Philadelphia, Pa.,	1857
Schmidt, Charles,	Baltimore, Md.,	1902
Schrader, August C.,	Baltimore, Md.,	1898
Simpson, William,	Raleigh, N. C.,	1873
Snyder, Henry N.,	Lancaster, Pa.,	1904
Tigner, James O.,	Greenville, Ga.,	1890
Wood, Edward S.,	Boston, Mass.,	1897

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF DUES ACCORDING TO ARTICLE III, CHAPTER VII, OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE ADOPTED AT MONTREAL, CAN., AUGUST, 1896. SEE PAGE 17, VOL. 44, PROCEEDINGS.)

		Elected.
Anderson, Rudolph J.,	New Orleans, La.,	1902
Appelbaum, Jerome,	Residence unknown,	1902
Arnett, William N.,	Indianapolis, Ind.,	1901
Baker, Howard S.,	Sioux City, Iowa,	1902
Batt, Hermann,	Chicago, Ill.,	1902
Bories, Emil,	Seattle, Wash.,	1902
Brown, Wm. A.,	Winnemucca, Nev.,	1893
Byers, Huizinga,	Pottstown, Pa.,	1900
Caldwell, Joseph F.,	Allegheny City, Pa.,	1902
Civins, Albert I.,	Philadelphia, Pa.,	1902
Colen, James A.,	Brooklyn, N. Y.,	1892
Cone, Earl H.,	Chicago, Ill.,	1901
Conger, Frederick A.,	St. Paul, Minn.,	1902
Conrad, John,	Chicago, Ill.,	1887
Cornell, Edward C.,	Brookings, S. Dak.,	1902
Crecelius, Charles E.,	New Albany, Ind.,	1900
Cureton, George D.,	Gaffney, S. C.,	1902
Daggett, Charles H.,	Providence, R. I.,	1902
Davies, John J.,	Scranton, Pa.,	1902
Deemer, George M. H.,	Atlantic City, N. J.,	1902
Dennin, Edwin C.,	Brooklyn, N. Y.,	1892
Dickman, Gustave A.,	St. Paul, Minn.,	1902
Dowdy, Joseph F.,	Little Rock, Ark.,	1894
Edwards, Frederick B.,	Hartford, Conn.,	1894
Eigelberner, Harry B.,	Chicago, Ill.,	1902
Fenner, Harvey A.,	Philadelphia, Pa.,	1902
Firmin, John C.,	Findlay, Ohio,	1893
Fisher, Dora C.,	Leavenworth, Kansas,	1902
Foster, J. Webb,	Baltimore, Md.,	1902
Gettel, J. Ralph E.,	Pittsburg, Pa.,	1902
Gibbard, George E.,	Toronto, Can.,	1902
Goldman, Oscar,	New York, N. Y.,	1900
Grossjohann, Ernest,	Manilla, P. I.,	1900
Haffner, Jean C.,	St. Louis, Mo.,	1901
Haines, Walter S.,	Augusta, Ga.,	1902
Hall, Alden T.,	St. Paul, Minn.,	1902
Hall, Lincoln G.,	Coggan, Iowa,	1902
Haydock, Mabelle,	Philadelphia, Pa.,	1902
Hinrichs, Gustavus D.,	St. Louis, Mo.,	1895
Hogan, John J.,	New Haven, Conn.,	1890
Holsendorf, Benj. E.,	Residence unknown,	1902
Johns, William G.,	Cleveland, Ohio,	1902
Keppler, Christian L.,	New Orleans, La.,	1882
King, Ferdinand H.,	Delphos, Ohio,	1901
Kloster, Benjamin J.,	Sioux City, Iowa,	1902

		Elected.
Knight, William C.,	Carrollton, Mo.,	1900
Loomis, John C.,	Jeffersonville, Ind.,	1876
Louis, Henry,	Iowa City, Iowa,	1902
Lunney, William J.,	Seneca, S. C.,	1902
MacRae, John J.,	Norfolk, Va.,	1894
Mack, George C.,	Bristol, S. Dakota,	1902
Markoe, George B.,	Jamaica Plain, Mass.,	1897
Mayo, Frederick B.,	Residence unknown,	1901
McAdams, Harry K.,	Lexington, Ky.,	1902
McKenzie, Hugh H.,	Cleveland, Ohio,	1902
Michels, Victor C.,	Albion, Ind.,	1902
Morris, George A.,	Fort Stanton, New Mexico,	1902
Morris, Henry M.,	Detroit, Mich.,	1902
Morrison, William M.,	Iowa City, Iowa,	1902
Murphy, John S.,	Pontiac, Ill.,	1896
Mutty, Walter C.,	Oldtown, Maine,	1902
Oster, Frank C.,	Cleveland, Ohio,	1902
Perkins, C. William,	Waterbury, Conn.,	1892
Peterson, John N.,	Bayonne, N. J.,	1902
Pine, Warren C.,	Riverside, N. J.,	1897
Poole, William E.,	Montpelier, Vt.,	1902
Powell, William D.,	Excello, Mo.,	1898
Pringle, James M.,	New York, N. Y.,	1902
Pursel, Robert C.,	Cincinnati, Ohio,	1902
Reeves, Sidney H.,	St. Paul, Minn.,	1902
Richardson, Edwin S.,	Marshall, Texas,	1902
Rogers, Anthony C.,	Gloucester, Mass.,	1902
Schutz, Chris,	Madison, S. Dakota,	1902
Seidel, John H.,	Biddeford, Maine,	1902
Smith, Francis M.,	Charleston, S. C.,	1902
Smith, James A.,	St. Louis, Mo.,	1902
Smith, Reuben R.,	New York, N. Y.,	1890
Stephenson, Charles W.,	Chicago, Ill.,	1902
Stewart, Aaron W.,	New York, N. Y.,	1902
Street, Edmund O.,	Baltimore, Md.,	1898
Swannell, Henry,	Champaign, Ill.,	1902
Taber, Joseph M.,	Elko, Nevada,	1901
Thomas, Frank W.,	Webb City, Mo.,	1902
Tidball, James T.,	Brookings, S. Dakota,	1902
Troxel, Henry L.,	Baltimore, Md.,	1902
Turner, Adam,	Orangeville, Canada,	1902
Viallon, Paul L., Jr.,	White Castle, La.,	1902
Vockroth, Emil,	Jersey City, N. J.,	1893
Weaver, Francis M.,	Oklahoma City, Okla. Ter.,	1900
Williams, Morrison P.,	Charlotte, N. C.,	1902
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